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VOLUME 125, No. 14 OCTOBER 2, 1947

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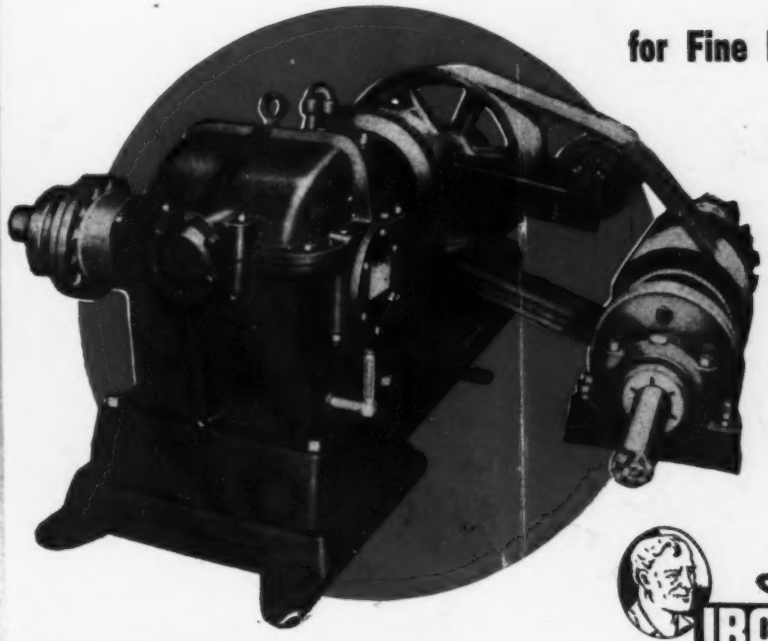

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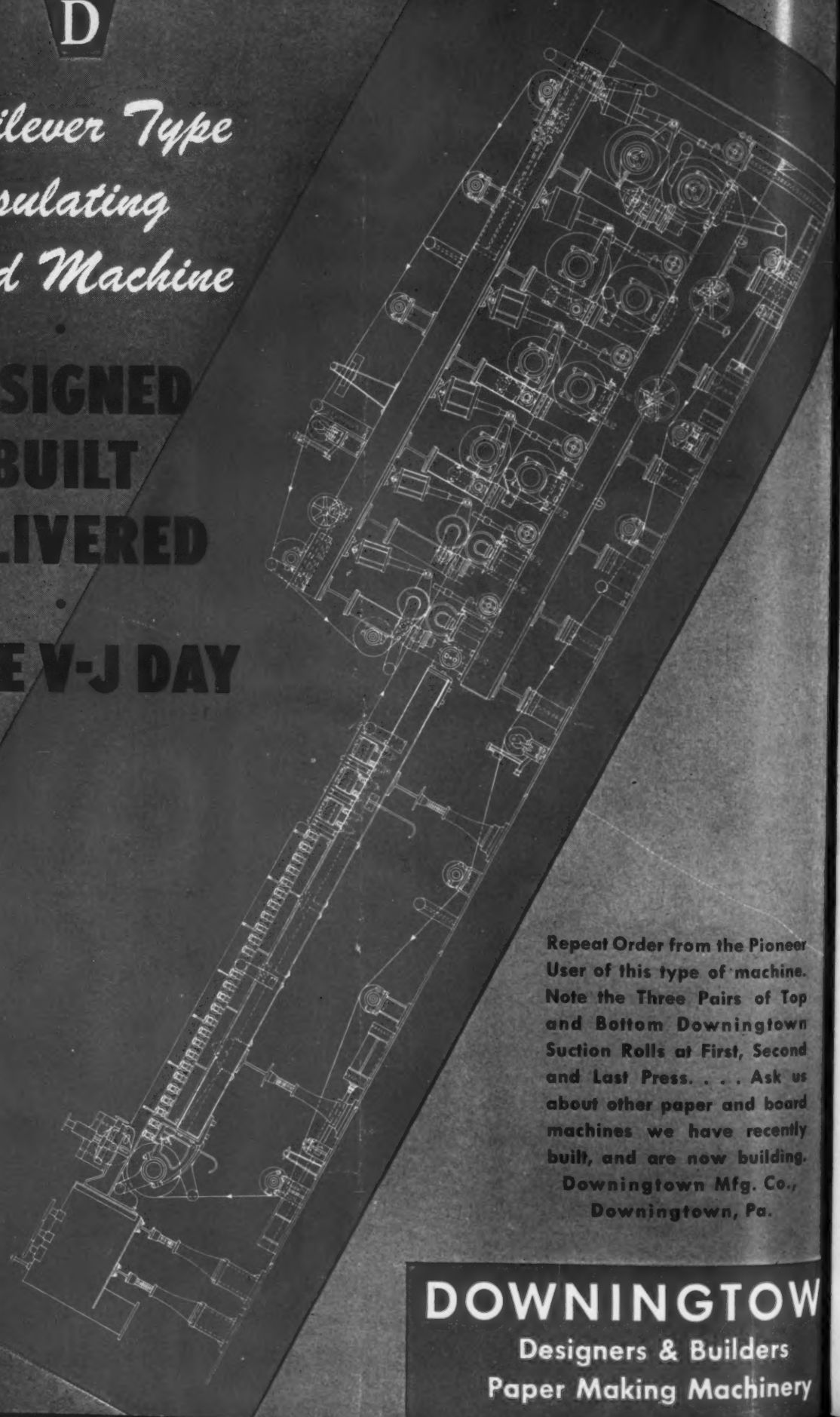

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CALENDAR OF COMING EVENTS

October 4-6, 1947—National Association of Waste Material Dealers, Inc. Fall Convention, Hotel Ritz-Carlton, Atlantic City, N. J.

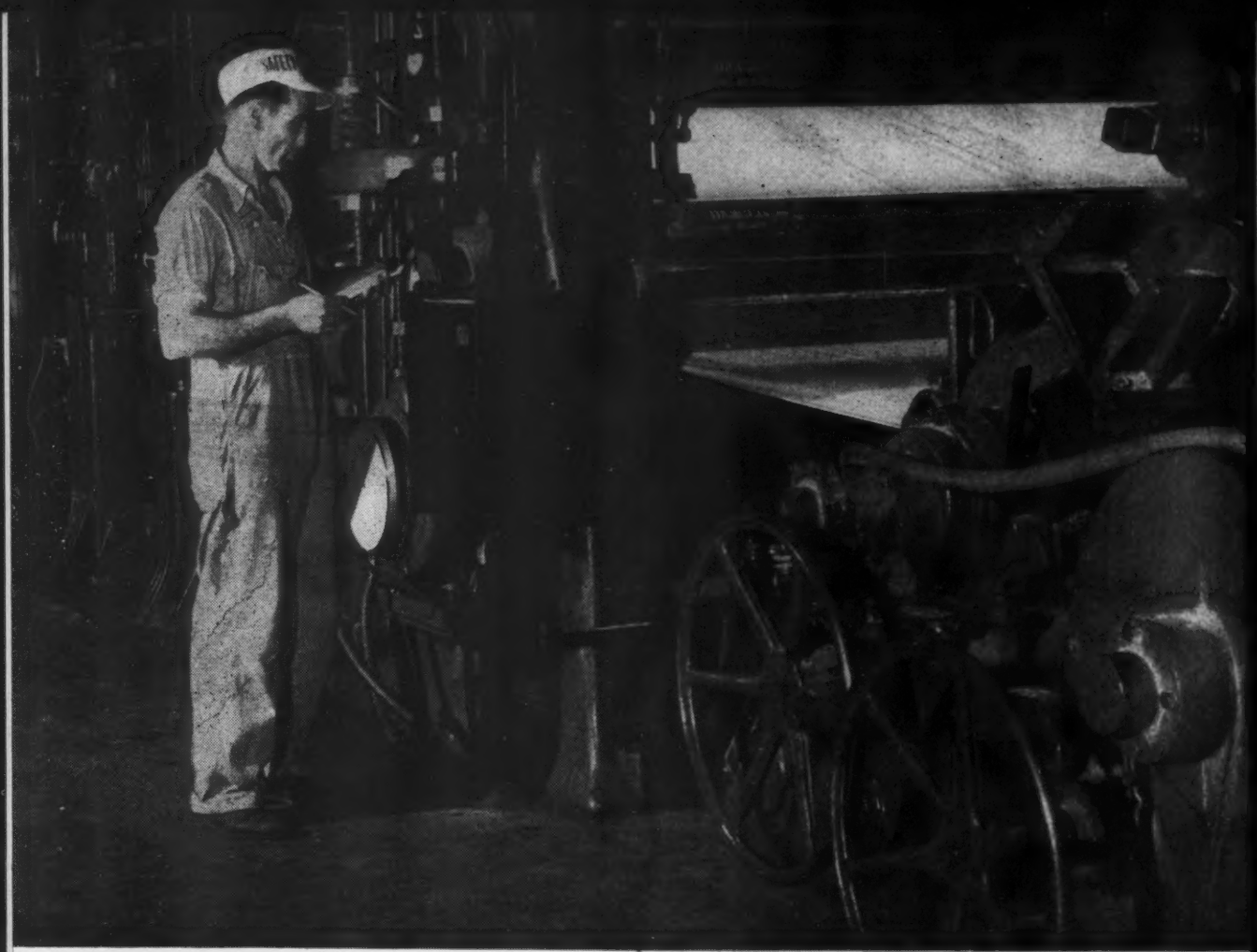
October 9-11, 1947—TAPPI Alkaline Pulping and Chemical Products Meeting, Asheville, N. C.

October 23-24, 1947—TAPPI Fibrous Agricultural Residues Meeting, Alton, Ill.

October 27-29, 1947—The National Paper Trade Association of the U. S., Inc., Semi-annual Convention, Hotel Sherman, Chicago.

November 3-5, 1947—TAPPI Second Engineering Conference, Philadelphia, Pa.

May 18-20, 1948—American Pulp and Paper Mill Superintendents Association, Annual Meeting, Roosevelt Hotel, New Orleans, La.



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Paper TRADE JOURNAL

VOL. 125, NO. 14 REG. U.S. PAT. OFF. OCTOBER 2, 1947

Coosa River Names Wakeman as Head

BIRMINGHAM, Ala.—Appointment of three officials of the Coosa River Newsprint Company was made known late last week by Edward L. Norton, president, following a meeting of the company's board of directors.

The board, under the chairmanship of Donald Comer, elected A. G. Wakeman as vice-president and general manager of the Coosa River company. Mr. Wakeman will be in charge of design and construction of the company's thirty million dollar newsprint plant at Childersburg, Ala., and will be in charge of its operation when construction is completed. Mr. Wakeman is well known in the paper industry, having been engaged in it for more than twenty-five years. He was director of the Pulp and Paper Division of the War Production Board during the war years. He spent the winter of 1944 in London at the United States Embassy on the Mission of Economic Affairs. Immediately following V-E Day, Mr. Wakeman made a survey for the army of the German pulp and paper industry, and executed a program to supply necessary paper products to Europe. Since 1945 he has been employed by Kimberly-Clark Corporation, in its multi-million dollar expansion program in this country and Canada.

The two other appointments were those of William E. Hornbeck, who will be resident manager, and Howard Neubauer, who will be office manager. Both Mr. Hornbeck and Mr. Neubauer were formerly employed by Kimberly-Clark Corporation, whose management of the Coosa River development was recently announced. Mr. Hornbeck and Mr. Neubauer will move with their families to Birmingham in the near future.

Mr. Norton simultaneously reported that, following the signing of a contract with J. E. Sirrine & Company, engineering firm of Greenville, S. C., for the engineering and design of the new mill, drilling operations are now in progress at Childersburg for the foundations of the building.

Ward Elects Smith As President

MERRILL, Wis. — Joseph Regenstein, Chicago, has been elected chairman of the board of the Ward Paper Company. David B. Smith, formerly secretary-treasurer, succeeds him as president. Robert S. Hartman, Chicago, is vice-president; Carl H. Luth, Merrill, secretary; and Gordon McNown, Merrill, treasurer. Directors are: Joseph Regenstein, Sr., David B. Smith, Robert S. Hartman, Joseph Regenstein, Jr., and F. P. Schneider.

International Appropriates $25 Million More for Kraft

NEW YORK — A thousand-tons daily increase in its overall capacity for kraft paper and boards is to be added to its existing facilities during the 1948-1949 period by the International Paper Company. This was made known by President John H. Hinman in a statement made at mid-week. The new program which contemplates 900 tons daily for board mills and 100 tons daily for paper is in addition to present projects, and will add another $25 million to the $22 million that was appropriated for the present year.

President Hinman's statement said:

"The board of directors of International Paper Company has approved a construction program for 1948 and 1949 involving the expenditure of $25 million in the United States. This program will include increases in kraft board capacity of the company of approximately 900 tons per day and kraft paper capacity of approximately 100 tons per day. In addition to this increased capacity it provides substantial expenditures to lower costs and increase efficiencies of existing mills and also provides for the acquisition of additional timberlands.

"Following the general policy of the company, the additional capacity will be obtained not by building new mills, but by changes in existing mills, which is a much more economical method.

"This brings to $47 million the total construction expenditures authorized by the company for the years 1947-1949. The 1947 program, which involved expenditures of approximately $22 million in the United States, including increased kraft paper capacity of 275 tons per day, is progressing according to schedule.

"The company plans to meet the expenditures involved in both of these programs without borrowing any money or issuing any additional capital stock.

"On September 30 the company paid $5 million on its unsecured two percent notes which represent the only interest bearing debt of the company. This payment reduces the outstanding notes to a balance of $5 million, of which $434,545.45 mature December 31, 1947."

Bowater Inspects Vancouver Sites

VANCOUVER, B. C. — Bowaters Ltd., largest supplier of newsprint in the British market, may erect a paper mill on Vancouver Island. A group of four representatives of Bowaters are touring the Island. They are headed by Arthur Baker and G. A. Roberts.

They are looking into two possible sites for the establishment of a plant. They inspected the situation at Duncan Bay, on the east coast of the Island, adjacent to the provincial government's new power plant at Campbell River. They also visited Nooka Sound on the West Coast, where timber and power are said to be available.

Bowaters Ltd. owns a famous mill at Cornerbrooke, Newfoundland.

Bachrach Photo

JOHN H. HINMAN

Tells of further kraft output expansion plans by International Paper Company.

De Carteret to Test Subpoena by U. S.

MONTREAL, Que.—S. L. de Carteret, president of Canadian International Paper Company, stated last week that the company and its subsidiary, International Paper Sales Company, Inc., have decided to test the validity of United States Grand Jury subpoenas for their Canadian newsprint records, returnable in United States District Court in New York, rather than submit Canadian records to a United States court without further contest.

American counsel have advised that failure to produce Canadian records at risk of possible citation for contempt is the only method by which an appealable decision of the District can be obtained.

Mr. de Carteret pointed out that Canadian International Paper Co. and International Paper Sales Company, Inc., are Canadian companies. He stated that the subpoenas covered virtually all the records of the companies relating to newsprint, including correspondence with and reports to the Dominion and Provincial Governments of Canada, and that the boards of directors of the companies have reached the conclusion that the question as to whether the companies are amendable to service of process in the United States is of paramount importance and should be taken to a higher court.

Mr. de Carteret added that the United States Department of Justice was advised recently by counsel that the companies had determined upon this course.

Frances Schilcher Returns Safely to Her Desk

NEW YORK—Miss K. Frances Schilcher, office manager of the Sulphite Paper Manufacturers Association, reported this week that she has fully recovered from the shock and the shaking up which closed her vacation. She was aboard a Pan-American Airways plane which developed engine trouble an hour before it was due to land from Bermuda at LaGuardia Field on September 20, and was brought down by its pilot at Floyd Bennett Field. Fire had put two engines out of commission and had destroyed the landing gear controls, but the pilot performed a masterly job, effecting a crash landing without injury to the plane's passengers.

Norton Promotes Ballard

WORCESTER, Mass. — Archibald H. Ballard has been appointed assistant director of research for the Norton Company. He will be in charge of the company's research laboratories in Chippewa, Ontario.

Union Bag Wins Oscar For Annual Report

NEW YORK—The 1946 annual report of Union Bag & Paper Corporation was judged as the best of the Paper Products industry in the final considerations of the Independent Board of Judges in the "Financial World" Annual Report Survey. The bronze "Oscar of Industry" trophy will be formally presented to Alexander Calder, president of the company, at the Annual Report Awards Banquet in New York on October 10. In this industrial classification, Dennison Manufacturing Company was runner-up for the "Best of Industry" award, while United Wallpaper, Inc., came in third.

The Independent Board of Judges is headed by Dr. Lewis Haney, professor of economics of New York University, and includes Glenn Griswold, editor and publisher of Public Relations News; Sylvia F. Porter, financial editor of the New York Post; Elmer Walzer, financial editor of the United Press; and Lester Tichy, art critic and industrial designer.

Extends Time For Bids On Petersburg Tract

WASHINGTON — The Forest Service has extended until January 5, 1948, the time in which bids may be made for the billion and half foot tract of Alaskan timber near Petersburg, Alaska.

The postponement, it was said, will enable parties who have already shown interest in bidding to clarify their qualifications, and will also allow time for additional concerns to meet the bidding qualifications.

Applicants will be advised whether they qualify by February 2, and the oral auction will be held in the Chief Forester's office, Washington, D. C., beginning at 2 p.m. February 18, 1948. All other terms and conditions of the sale, said the Forestry Service, remain unchanged.

The agency said deferment of the bidding will not materially delay the projected development, as the preliminary award is scheduled to be made just in advance of the spring field season in Alaska.

Carey Will Sell Leshner Plant

CINCINNATI — Philip Carey Manufacturing Co. has disclosed plans for selling its Leshner division plant at Hamilton. According to Charles A. Lambie, executive vice-president of the Carey concern, the plant will be sold to a group of executives and employes associated with the Leshner division for more than $1,000,000.

Nathan Leshner, who heads the purchasing group, said the new concern, to be known as the Leshner Corporation, will continue the manufacture of industrial wiping cloths and paper mill supplies.

Champion Timber Buy Raises Texas Hopes

BEAUMONT, Tex. — The Champion Paper & Fibre Company, Hamilton, Ohio, is said to be giving consideration to the construction of a paper mill in East Texas along the Neches river, according to the Beaumont *Enterprise*, local morning newspaper.

The company now operates a mill at Pasadena, which is headquarters for the Houston division.

Approximately 10,000 acres of timberland has been purchased by the company in Jasper and Hardin counties recently, according to Charles W. Dabney, Jr., of the Houston division.

Mr. Dabney said the company has not chosen a spot for another mill yet but planned to build somewhere. He said some consideration is being given to the Neches river sector near Evadale, although no location has been selected or land purchased for a site. The land which was bought merely for timberland can be used as a source of pulp wood, it was pointed out.

The company has inquired regarding availability of water for a mill in the Evadale sector, however, it was learned. Mr. Dabney agreed this had been done but said similar investigations have been made in other sectors. He said the Pasadena mill has just about exhausted timber which is readily accessible.

The company has considerable holdings of timber in Newton county also, it was stated.

Bowater Sees No End To Newsprint Demand

MONTREAL, Que.—Sir Eric Bowater, chairman of Bowater Paper Corporation, said in an interview here that there is no foreseeable end to the world-wide shortage of newsprint, which he described as the consequence of enormously increased demand since prewar years.

Sir Eric estimated that if British newspapers were to return to the average number of pages they contained before the war they would require 2,000,000 tons of newsprint instead of 1,250,000 because of increased circulation.

He is in Canada after having visited the plant of Bowaters' Newfoundland Pulp and Paper Mills Ltd., of which he is president.

Badger-Globe Foremen Open Meeting Season

NEENAH, Wis.—Badger-Globe Foremen's Club held its annual kick-off dinner and meeting September 29 with a get-together at the home of Howard Palmer preceding a 7 o'clock diner at the Neenah recreation building. The club is planning a dinner-dance November 1, and will hold its first formal meeting on October 13.

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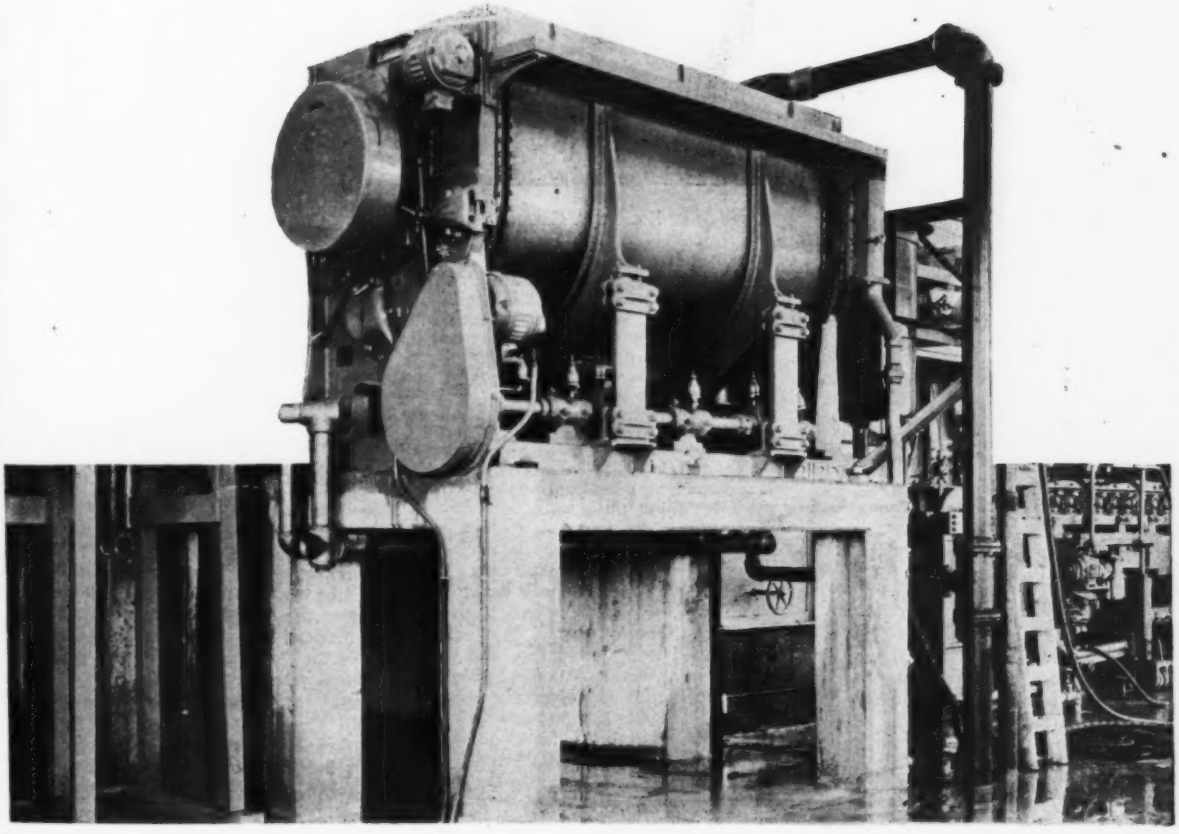

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Fowler Finds Shortage Of Newsprint Abroad

NEW YORK — The newsprint supply in Great Britain, France and the Netherlands is "unbelievably small," Robert M. Fowler, president of the Newsprint Association of Canada, declared here last week, adding that newspapers there are not large enough to present a "minimum of essential information" about world affairs to the people.

Mr. Fowler was one of 1,999 passengers who arrived here on the Cunard White Star liner *Queen Mary*. He said he had spent one month abroad as a representative of the United Nations Educational, Scientific and Cultural Organization surveying the needs of the press and radio and film industries.

He said paper mills in England were operating at only one-third of capacity, resulting in presentation to the British public of four-page papers. The size of Dutch papers is about the same, he added, while in France newspapers average about two pages.

Mr. Fowler said the newsprint capacity of mills of Western Europe was ample, but the problem is to get them operating at full capacity. Until that time, he asserted, the newsprint must come from North America, adding that a shipment of 50,000 to 100,000 tons would go a long way in alleviating the shortages, particularly in France and Holland.

Paper Tube Names Chase and Adams

WOONSOCKET, R. I. — Frederic L. Chase, Jr., and Samuel F. Adams will assume new sales duties with American Paper Tube Company, of Woonsocket and Greenville, S. C..

Mr. Chase becomes Eastern sales representative, working out of Woonsocket. Mr. Adams will be sales representative for Georgia, Alabama and Tennessee, operating out of Greenville.

Mr. Chase rejoins the company which he left in 1942 to go to National Ring Traveler Co., as assistant to the treasurer. He left the latter firm for service with the American Red Cross from 1943 until 1945, and returned to work for it until recently. He has been secretary and treasurer of the New England Textile Club since 1933, and is a member of the Boston Textile Dinner Club.

A. M. Borders Joins Institute Staff

APPLETON, Wis. — Dr. Alvin M. Borders, formerly associated with Goodyear Tire & Rubber Company, joined the staff of the Institute of Paper Chemistry on October 1.

Dr. Borders received his educational background at Indiana University, receiving his Ph.D. degree in 1937. He joined the Goodyear staff the same year and was the research director of the Sunthetic Rubber Group of the company. During World War II, he was loaned by Goodyear to the Office of Rubber Reserve, where he was Chief of the Copolymer Research Branch. He was in charge of the coordination of industrial and university research on synthetic rubber.

As a member of the staff of The Institute of Paper Chemistry, Dr. Borders will be the leader of the Physical Chemistry Group. His duties will include teaching and research in the applications of physical chemistry to the pulp and paper industry. His education and subsequent experience admirably qualify him for those duties.

Dr. Borders is a member of the American Chemical Society and has been honored by election to Sigma Xi and Phi Beta Kappa.

ROBERT P. GREEN

Promoted from the engineering department to the position of assistant to the sales manager of the E. D. Jones & Sons Company, Pittsfield, Mass. He has assumed his duties. Mr. Green entered company employ in 1935 after completing a high school correspondence course from the American School at Chicago and attending the Berkshire Business College. He started in the shop and has served successively as head of the laboratory, a draftsman and assistant to the chief draftsman. He also has done service work in paper mills throughout the country.

Rasmussen Opens as Sales Consultant

CHICAGO—James H. Rasmussen has resigned as vice-president of United Wallpaper, Inc., to enter his own business as manufacturers' sales representative and market consultant, operating under the firm name of J. H. Rasmussen and Company. The new company has leased space in the Merchandise Mart and will be open for business on or about October 15th.

Taylor Tells Aim of Trees for Tomorrow

APPLETON, Wis. — M. N. Taylor, Merrill, Wis., executive director of Trees for Tomorrow, Inc., before the Appleton Rotary Club here September 23, showed motion pictures of reforestation work in northern Wisconsin, and charts illustrating the history of Wisconsin forests.

He said that reforestation projects should have been started long ago, and outlined the program of Trees for Tomorrow. He declared that in 1870 Wisconsin had 20 million acres of virgin timber, and that in 194 there were only 4,000 acres, most of them located in nine northeastern counties.

Paper mill executives who established Trees for Tomorrow hope that by 1970 the state will have 10 million acres reforested on land which is not suited for other purposes.

Taylor explained how Trees is distributing pine, spruce and balsam to farmers and woodlot owners. He said the organization has been instrumental in setting out 2 million trees by private owners, has mapped 25,000 acres of wooded areas and has helped establish 25 school forests and two memorial forests.

Morris Presents Kass Reinhold-Gould Award

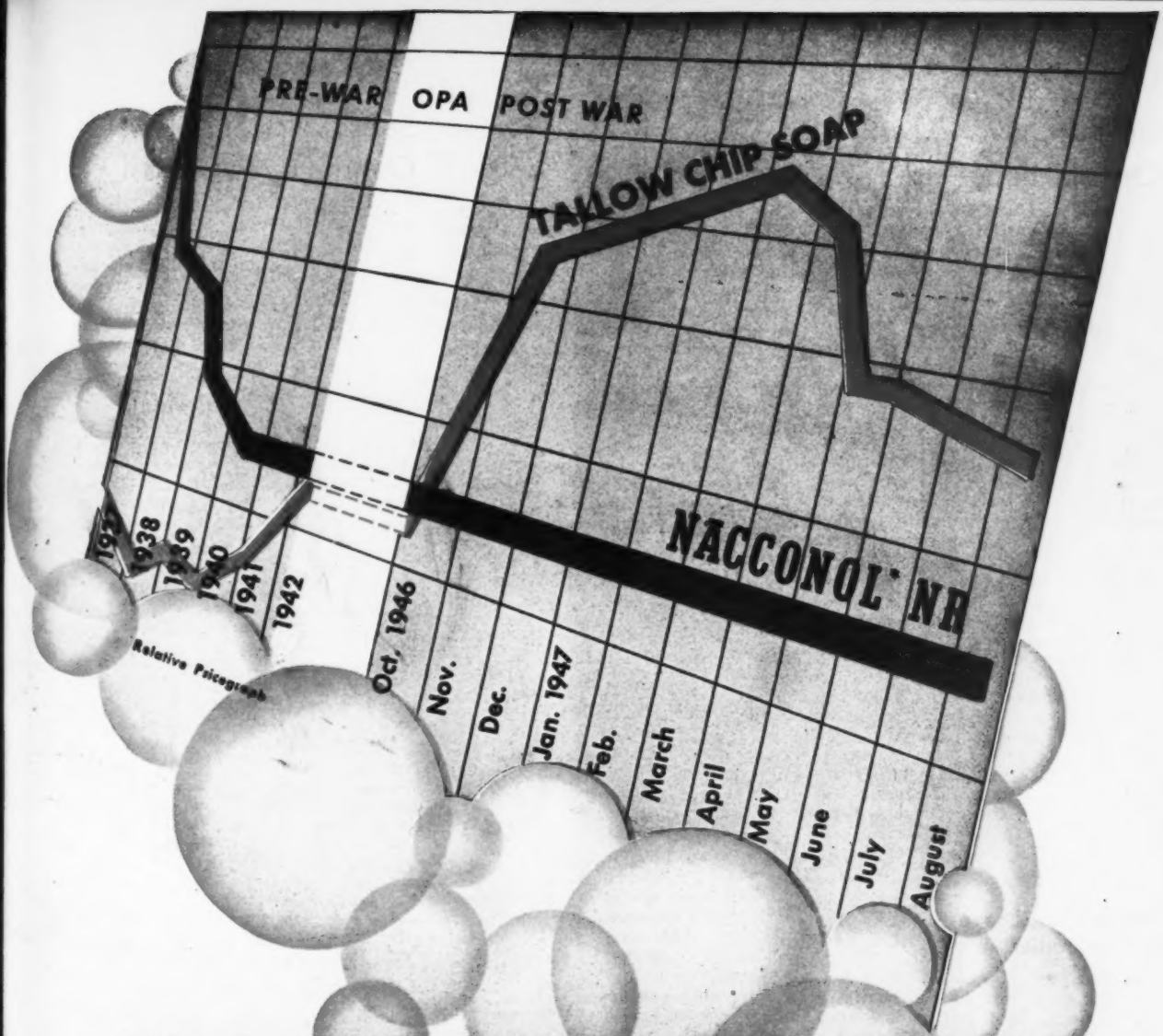
NEW YORK—Herman Kass, production executive at Wickersham Press and immediate past president of The Navigators, received the Reinhold-Gould Award for Distinguished Service to the Graphic Arts at the September meeting of the club in Gramercy Tavern. C. V. Morris, vice-president of Reinhold-Gould, Inc., New York paper merchants, made the presentation.

Appointed as committee chairmen for the 1947-1948 season were William Gleason, executive and program; Kass, welfare; Harry E. Stoddard, bowling; and Morris, publicity and "Log."

Gleason announced at the conclusion of the meeting that K. C. Pratt, house magazine authority and editor of *Stet*, monthly bulletin for house mazazine editors, would be the speaker at the October 12th meeting. Pratt will be sponsored by the Champion Paper and Fibre Company, Hamilton, Ohio.

Stanley Reed Elected New Crystal Vice President

MIDDLETOWN, Ohio — Directors of the Crystal Tissue Company, manufacturers of wrapping tissues and waxed papers, have elected Stanley H. Reed as vice-president in charge of sales. Mr. Reed, who has been connected with Crystal for 17 years, the past few as sales manager, was born in Lima, Ohio, and has spent most of his life in Middletown. He was graduated from Middletown High School and Ohio Wesleyan University.



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Lime Recovery Next On Thilmany List

KAUKAUNA, Wis. — Thilmany Pulp and Paper Company is awaiting delivery of control equipment for a lime recovery system which will remove 3¾ tons of lime a day from the air. Steel flues and ducts have been installed and the major mechanism is being installed, according to C. R. Seaborne, vice-president.

The awaited equipment will go into the lower mill where 37 tons of lime are burned daily, about 10 percent of which goes up the stacks.

This is the third step of Thilmany's five-point program to eliminate ash and smoke. A precipitator was installed in 1946 on the bark burning furnaces, and it removes about a truckload of ashes daily. A second unit, a chemical dust eliminator, went into service last June.

Equipment to handle about 3½ tons of coal ash per day from the lower mill has been promised for delivery in April, 1948, Seaborne said.

The ash problem from the upper mill stack is being gradually decreased by the removal of paper machines from the mill. At present only two machines are in operation and they are to be removed. When the removal has been completed, the problem will be studied in view of the lightened load, and necessary action taken to eliminate the nuisance.

Wilson Gets Leave to Pursue Studies

SPRINGFIELD, Mass. — W. R. Elliot, general manager of Shawinigan Resins Corp., here, has made known the award to Wilfred K. Wilson of a year's leave of absence at full salary.

This is the first award granted by the company under a policy initiated to enable outstanding members of its technical staff to continue academic work.

Mr. Wilson, a member of the research staff, was selected because of his work on polymerization processes and techniques which has led to development of important commercial products. He will study at the High Polymer Institute of the Polytechnic Institute of Brooklyn.

Coast Paper Men Bask In Deep Sea Sunlight

LOS ANGELES — Members of the Paper Mill Men's Club of Southern California spent a delightful day deep-sea fishing off Newport Bay, but the biggest fish of the day was caught by a guest. Ike Armstrong was the lucky man, and the unlucky fish was a 52-pound albacore. The occasion was the club's annual August outing, held August 12.

The Paper Mill Men's Club of Southern California is purely a social organization made up of sales representatives of the various paper manufacturers, converters, and cordage companies who live in Southern California.

The August meeting of the Club is customarily devoted to a sporting event and this year the organization chartered the new super-modern, all-aluminum deep-sea fishing boat Alalunga for a day's high-sea angling.

Forty-eight members and guests made up the party, which was managed by Co-Chairmen Dewey Megel of Silklin Paper Company, Al Hentschel of Johnson, Carvell & Murphy, Neil Sinclair of Sinclair-Lange, and "Lardy" Brenzel of Los Angeles Paper Bag Company.

Says Argentine Must Restrict Newsprint

BUENOS AIRES — Miguel Miranda, Central Bank head and "economic czar" of the country, has warned Argentine newspapers to "tighten their belts" because there will be no newsprint imports "for a long time."

Senor Miranda also announced that Argentina will reduce further her general imports from the United States until the latter imports more Argentine products. Argentina's main import need is petroleum for transport power.

Senor Miranda said several weeks ago that no exchange would be alloted for newsprint imports during the rest of 1947. Today he indicated the newsprint embargo might be extended well into 1948 and he told a press conference that newspapers "will have to live off what newsprint they have for a long time to come."

Opposition newspapers have often listed Government restrictions on newsprint imports as among several official moves allegedly designed to curb press freedom.

"The country can survive without newsprint but it would starve without petroleum," Senor Miranda said. "I cannot understand why everybody is so upset about newsprint."

CIO Seeks Members At Eaton Plant

PITTSFIELD, Mass. — For the first time since passage of the Taft-Hartley Act, an attempt is being made to organize employees of a Pittsfield area manufacturing plant. Thirty-six-year-old Frederick D. Sandner, international representative of the United Paper Workers, a CIO affiliate, has been distributing organizational leaflets to personnel of the Eaton Paper Corporation.

Stating that the Eaton Corporation's rates of pay are low as compared with the wages paid in organized paper manufacturing plants, Sandner disclosed that he had been laying the groundwork for his attempt for two months. He said succeeding steps would depend on the reaction to the distribution of the leaflets.

Sees Pulp Supply Overtake Demand

NEW YORK—If demand for and production of paper continues at the present rate through the winter and spring, there will probably be a balance between supply and demand for market pulp by the early summer of 1948, Hugo H. Hanson said last week in this city. Mr. Hanson is president of the Association of Pulp Consumers and head of W. C. Hamilton & Sons, Miquon, Pa.

In a statement issued after a meeting of the association directors at the Waldorf-Astoria, Mr. Hanson declared that under these conditions increased production of market pulp should overtake demand by next summer. He added:

If there should be any setback in demand for paper resulting in a decline of over-all operations of from 5 to 10 percent, the market pulp supply will come into balance with demand very quickly. We would then be likely to see an end of the $50 to $75 premiums presently being paid for pulp above the general level of domestic and Canadian contract prices."

It is generally believed, Mr. Hanson explained, that converting mills depending upon market pulp supply will be in a better position at the end of this year than they were a year ago and therefore will be beter able to sustain production during the so-called navigation period.

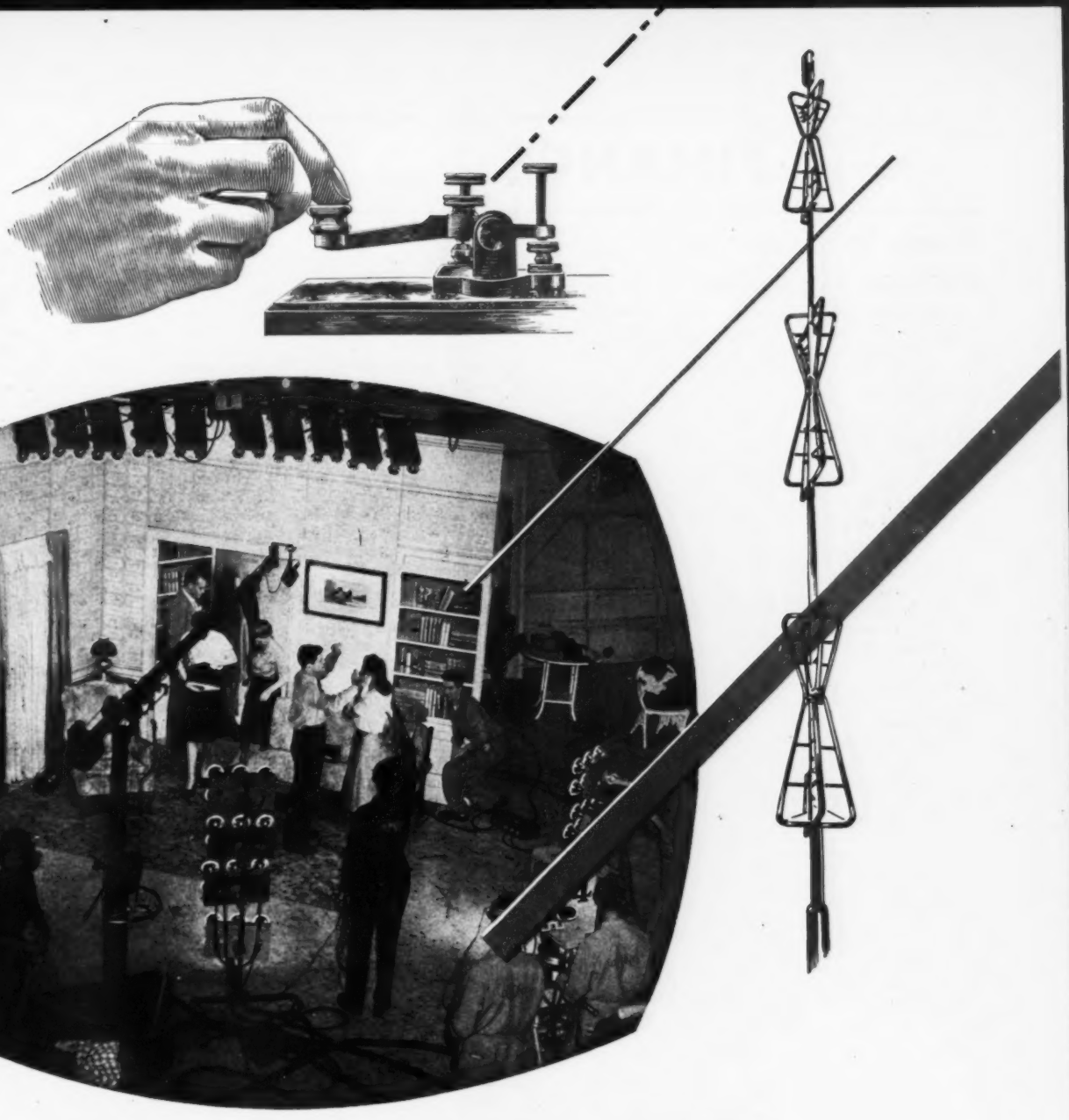
American Paper Goods Offers Stock Rights

BERLIN, Conn.—The American Paper Goods Co. has notified stockholders of their right to subscribe for additional shares of common capital stock in a proportion of one share for each six of the $25 par value shares now held. President E. S. Lancaster said the purpose is to provide additional working capital and to provide for expansion to meet an increasing market for the company's products.

The right to subscribe will terminate at 3 p.m. October 8 and if any of the 6000 shares are not bought by stockholders they will be sold to the highest bidder at the company office October 10 for not less than $48 a full share.

Clayson Heads Group for Community Chest Drive

PITTSFIELD, Mass.—George P. Clayson, Jr., president of the Eaton Paper Corporation and an active leader in many organizations in this city, has been named chairman of the special gifts committee for next month's Community Chest drive here. A member of this group for several years, Clayson was its successful chairman only two years ago.



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FINANCE

Fraser Improvements Increase Capacities

MONTREAL, Que.—Expansion of the activities of Fraser Companies Ltd., and subsidiaries in New Brunswick and Maine is reflected in revised capacity figures. These figures used in the review of the company's operations indicate that the company's new pulp mill at Newcastle, N. B., is being designed to manufacture approximately 120 tons daily of unbleached sulphate pulp or kraft and is now expected to be in operation sometime in 1949.

New capacities: Edmundston, N. B. —high-grade unbleached sulphite pulp, 105,000 tons annually, of which 80 percent is bleached; paperboard 20,000 tons and groundwood pulp 35,000 tons per annum; Madawaska — high-grade sulphite papers 75,000 tons and catalogue paper 42,000 tons per annum; Athol, N. B. — bleached sulphite pulp 60,000 tons per annum.

Favorable operations in the first six months of 1947 are reflected by the recent declaration of an extra dividend of 50 cents per share applicable to the first six months, along with the regular quarterly dividend of 50 cents, both payable Oct. 25, 1947.

The company's properties include: a sulphite pulp mill, groundwood mill and paperboard mill at Edmundston, N. B.; two saw mills and one shingle mill in eastern Quebec and New Brunswick, both having planing mills in operation. Through ownership of Restigouche Co., the parent company controls a bleached sulphite mill with a daily capacity of 200 tons at Athol, N. B.

Through its subsidiary, Fraser Paper Ltd., the company also controls a modern high grade mill engaged in the manufacturing of bond, catalogue and waxing papers at Madawaska, Me. The sawmills have a combined annual manufacturing capacity of approximately 25,000,000 ft. bm of spruce lumber, in addition to shingles and railway ties.

Fraser Companies and its subsidiary Restigouche Co. Ltd., own 1,561 sq. miles of freehold timber lands and control 3,828 sq. miles of Crown timber limits in New Brunswick and the eastern part of the province of Quebec.

Fraser Companies is engaged in the manufacture of bleached and unbleached sulphite pulp and lumber products and its subsidiaries manufacture bond and other specialty papers and bleached sulphite paper and dissolving pulps.

Eastern Corp. Refinances Its Outstanding Mortgage

NEW YORK—The Eastern Corporation has arranged through Central National Corporation, New York, a serial loan of $2,000,000 maturing October 1, 1948 to October 1, 1952. The notes will carry a 2 percent interest rate. The proceeds together with treasury funds are being used to retire the company's outstanding first mortgage 3¾ percent bonds.

Eastern Corporation, with mills at South Brewer and Lincoln, Maine, is one of the country's largest manufacturers of fine papers. For more than 25 years, Eastern has pioneered in the development of improved processes in the manufacture of pulp as well as paper. In fact, the first acceptable dissolving pulp made in the United States for the manufacture of rayon was developed by Eastern's research staff in its South Brewer laboratories.

The many improved processes which have come out of these laboratories have been perfected by the same staff of chemists and engineers. Many of these have been put into successful operation with results far exceeding expectations. Besides having already resulted in an improved product, additional important economies are expected to accrue from the new methods through reduced costs and materially increased production.

The corporation owns extensive woodlands in Maine and Nova Scotia and a large percentage of wood used in their plants come from their own properties.

Nepco Declares Extra Payment on Common

PORT EDWARDS, Wis. — Nekoosa-Edwards Paper Company has declared a special dividend of 25 cents per share on common stock, paid in addition to the 25-cent third quarter dividend, to stockholders of record September 20. The extra dividend brings the total payment for the first three quarters of the calendar year to $1 per share or four percent of the par value of $25 per share.

John E. Alexander, president and general manager of the company, in a letter to the stockholders, declared profits for the first half, after taxes, amounted to $1,458,000, and during the same period the working capital was increased $872,000 to a total of $6,-861,000. Mr. Alexander pointed out, however, that large capital expenditures are being made.

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending September 27, 1947

STOCKS

	High	Low	Last
A. P. W.	4¼	4	4
Armstrong Cork Co.	48½	47½	47⅝
Armstrong Cork Co., pf.	107	106⅜	106⅞
Celotex Corp.	29¼	28¼	28¼
Celotex Corp., pf.	20½	20¼	20½
Certain-Teed Products Corp.	17⅝	16⅝	16⅞
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	23½	23	23¼
Champion Paper & Fibre Co., pf.	107½	106	107½
Congoleum Nairn Co.	29¼	28⅝	28⅝
Container Corp. of America	41¾	41⅝	41½
Container Corp. of America, pf.	102¾	102¾	102¾
Crown Zellerbach Co.	31¼	30½	30⅝
Crown Zellerbach Co., pf. 4.20	105½	104	104
Crown Zellerbach Co., 4 pf. 4	116½	115	115
Dixie Cup Co.	39½	38	39
Dixie Cup Co., A	53½	52¼	53
Flintkote Co.	35¾	34¾	34⅞
Flintkote Co., pf.	107¾	107	107
Robert Gair	9⅛	8⅝	8¾
Robert Gair, pf.	20	19⅞	19⅞
International Paper Co.	52⅞	49¾	52⅝
International Paper Co., pf.	105¾	104	104
Johns-Manville Corp.	43¾	41¾	42½
Johns-Manville Corp., pf.	118	117¾	118
Kimberly-Clark Corp.	23¼	23	23¼
Kimberly-Clark Corp., pf.	109½	107½	107½
Mac Andrews & Forbes	37¼	36¾	36¾
Mac Andrews & Forbes, pf.	145½	145½	145½
Marathon Corp.	23¼	22½	23
Mead Corp.	21	20¼	20¼
Mead Corp., pf. 4¼	95	94½	95
Mead Corp., pf. 2	46½	45½	45⅞
National Container Corp.	13⅞	13⅜	13⅜
Paraffine Companies, Inc.	69	68	69
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	28¼	27	27¼
Rayonier, Inc., pf.	37½	37¼	37¼
Ruberoid Co.	59⅞	57½	59⅞
St. Regis Paper Co.	10⅜	10	10¼
St. Regis Paper Co., pf.	94	92½	93½
Scott Paper Co.	46¼	45⅝	46⅛
Scott Paper Co., pf.	102½	102	102
Sutherland Paper Co.	39	39	39
Union Bag & Paper Corp.	34¼	32¼	33⅜
United Paperboard Co.	17¼	15¾	17
U. S. Gypsum Co.	100	98¾	99½
U. S. Gypsum Co., pf.	187	187	187
West Virginia Pulp & Paper Co.	42¾	42	42½
West Virginia Pulp & Paper Co., pf.	111¾	111½	111¾

BONDS

Celotex Corp., 3¼s '60	103⅜	103⅜	103⅜
Certain-Teed Products Corp., 5½s '53	....	....	....
Champion Paper & Fibre Co., 3s '65	101¾	101¾	101¾
Mead Corp., 3s '68	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending September 27, 1947

STOCKS

	High	Low	Last
Great Northern Paper Co.	45	43⅜	44
Taggart Corp.	10	9⅞	10

BONDS

American Writing Paper Co., 6s '61	102	102	102

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Celanese Research Opens at Summit

SUMMIT, N. J.—On the occasion of the formal opening of the company's central research laboratories here this week, Celanese Corporation of America revealed the establishment of an annual Professional Progress Award in Chemical Engineering — the first major general award in that field — which is to be administered by the American Instituteo f Chemical Engineers.

Harold Blancke, president of Celanese Corporation, made the announcement before a group of several hundred business men, educators, scientists and press representatives who were viewing for the first time the new and modern 140-room research project, which is a coordinated group of many separate laboratories and pilot plants.

The annual award has been established for the purpose of recognizing in the field of chemical engineering distinguished achievement which has contributed to the improvement of human relations and circumstances. It is to be limited to persons under 45 years of age and will consist of $1,000 and a suitable certificate.

The rules of eligibility provide that the annual award is to be made for a significant contribution to the science of chemical engineering. Such contribution may be either a theoretical discovery or development of a new principle; a development of a new process or product; an invention or development of new equipment; or distinguished services rendered to the field.

George Schneider, vice-president and technical director of Celanese Corporation of America, presided at the day's program. In a short address he traced the history and growth of the company's research.

"As research expanded," he said, "it became evident that some degree of centralization was necessary, especially for the more basic problems of chemistry and physics. For this purpose the Summit building was acquired and during 1946 and this year it was transformed into the modern laboratory it is today.

"The staff of the central laboratories here consists of groups of cellulose chemists, synthetic organic chemists, dyestuff chemists, physical chemists and chemical engineers. The greater part of the personnel was transferred from the corporation's research departments at the Newark, N. J., and Cumberland, Md., plants.

"However, one should not draw the conclusion that research is no longer carried out at other plants. Important development work is in progress there and pilot plants with necessary laboratory facilities are operated. In general, the research work at the central laboratories is of a basic or exploratory nature carried out in laboratories or small scale pilot plants while the research work at the factories is usually carried out in large pilot plants or with plant scale equipment."

Bjorn Andersen, director of central research and development, declared in the principal address of the day that American industry today needs a steadily changing diet of new ideas and new fundamental concepts in ever greater numbers to keep it healthy.

"That is why," he asserted, "industrial research has to look for a growing supply of true research workers, men trained so broadly and fundamentally from our institutions of learning that they have the fertile background needed to be truly creative if given the necessary freedom and environment in our industrial laboratories.

"This might suggest less emphasis on specialization in our universities for a larger percentage of the student body, even on the graduate level, and more emphasis on a wider exposure to the fundamental sciences. Our objective should be to foster in such a student the maximum development of his analytical mind and a true assimilation on the broadest scale of the known scientific concepts of nature."

Whittington Joins American Potash

NEW YORK—Joseph S. Whittington has joined American Potash & Chemical Corporation as manager of sodium sulfate sales. He will be located at the New York office of the company. Mr. Whittington was formerly with F. W. Berk & Company, Inc.

ARTHUR H. BROWN

Who since October, 1945, has been District Manager of Sales in the Pittsburgh (Pa.) Sales Office of Lukens Steel Company and subsidiaries, By-Products Steel Corporation and Lukenweld, Inc., has been named District Manager of Sales for the Coatesville (Pa.) District Sales Office. Mr. Brown succeeds W. E. Mullestein, whose appointemtn as Manager, Field Sales for Lukens and subsidiaries was recently announced.

Manual for Teachers Stresses Forestry

COLLEGE STATION, TEX.—"Forestry For Teachers," a new 76-page illustrated publication which the Texas Forest Service, A. & M. College, believes will serve as a model in its phase of educational instruction, is now being distributed to school and college libraries throughout Texas.

Because copies of this first printing are limited, it is believed this distribution will serve the greatest need, particularly if the manual is made a permanent part of library collections so it may be available to all teachers.

"Forestry For Teachers" was written for the use of elementary and high school teachers. It was designed to give teachers a background of basic subject matter in forestry and to provide pupil activities and suggestions for correlating forestry topics with regular school courses.

The booklet was approved by the state Department of Education and was prepared as part of the Texas Forest Service's cooperative education program with that department. Members of the technical staff of the Texas Forest Service made noteworthy contributions.

The original manuscript was reviewed by a number of competent authorities in forestry, education and other fields. Among those who have given their stamp of approval are L. A. Woods, state superintendent of Public Instruction; Dr. A. W. Birdwell, president emeritus of Stephen F. Austin State Teachers College; Dr. Walter Taylor, leader of the Texas Cooperative Wildlife Research Unit; Dr. George B. Wilcox, head of the Department of Education and Psychology, A. & M. College; Dr. Rudolf Bennitt and Dr. Ralph K. Watkins, University of Missouri.

"Forestry For Teachers" is the latest work of the author, Everett F. Evans, who wrote six of the seven Conservation Teachers manuals published by the Missouri Conservation Commission in 1940-41. Evans came to the Texas Forest Service as school specialist in 1946. After getting his master's degree at the U. of Missouri in 1941, he worked with the Missouri Conservation Commission until he entered military service in 1942.

Evans has published a number of magazine articles in the field of conservation education. He will soon publish another booklet through the Texas Forest Service, "Pupil Activities in Forestry and Related Conservation Subjects."

Wilton Wins Class C Cup

NEENAH, WIS. — Frank Wilton has captured the Harry Price "C" flight championship in the annual Kimberly-Clark Corporation golf tournament by defeating Howard Crabb in the finals, 2 and 1.

Washington Forestry Names 3 to Faculty

SEATTLE—Three new members have been appointed to the faculty of the College of Forestry at the University of Washington. These include: Dr. Harvey D. Erickson as associate professor of Forest Products; Dr. Philip G. Haddock as assistant professor of Silviculture; and Bernard L. Orell as assistant professor of Forestry.

Dr. Erickson received both his undergraduate training and his graduate training in forestry at the University of Minnesota, majoring in wood technology and biochemistry. During the period of his graduate work he held an American Creosoting Company fellowship at the University of Minnesota. He is the author of a number of publications in the field of wood-liquid relationship, and in wood technology. He will handle the courses in wood technology, and in general utilization. Part of his time will be devoted to research in these fields. He comes to the University from the Division of Forestry of West Virginia University.

Dr. Haddock received his undergraduate training in forestry and his graduate work in plant physiology at the University of California. Prior to the war he was employed by the United States Forest Service at the California Forest and Range Experiment Station. While doing graduate work he held the Baker fellowship, and was employed in part-time research and in assisting the teaching staff of the School of Forestry. From 1942 to 1945 he was in the United States Army Air Corps and served with that branch of the service in Italy. He comes to the University from the New York State College of Forestry, and will handle the work in silviculture and ecology.

Professor Orell received his bachelor's and master's degree in forestry from Oregon State College. Since 1941 he has been employed by the Oregon State Board of Forestry except for the three and a half years of military service in the Army Signal Corps. His main job with the State Board of Forestry has been fire protection, and he has handled much of the training and the public relations program carried on in connection with this work. He is the author of a number of publications dealing with fire training and education, and the general field of fire control. He will handle the work in fire protection at the College, and the freshman courses in general forestry.

Judge Goes to Hospital

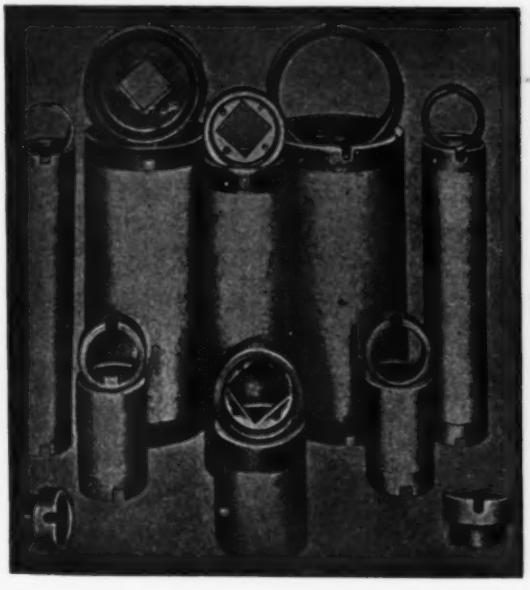
HOLYOKE, Mass.—Gerald A. Judge, treasurer of the Eureka Blank Book Company of this city and former selectman of South Hadley, was taken to the Providence hospital recently suffering from a coronory thrombosis.

N. Y. U. Again Opens Its Paper Course

NEW YORK—The first lecture in the series of three courses for the paper, publishing and affiliated industries offered this year by New York University's School of General Education opened on Wednesday, September 24, at the Barbizon-Plaza. About two hundred were present.

In outlining plans for the course, Harold M. Annis of the Oxford Paper Company, serving as moderator, directed special attention to the young women of the group, thirteen of whom, it was learned, are secretaries from the Mead Company office. Mr. Annis commended the farsightedness of concerns who make this training available to their secretaries.

"Paper the Pacemaker," the film of the F. C. Huyck & Sons Company, was followed by an address by E. W. Tinker, executive secretary of the American Paper and Pulp Association, which sketched the growth of the paper industry from 1810 through 1947 to its rank of sixth in the United States, its outlook in world markets, and its present-day problems. Hammermill Paper Company's sound film "The Gift of Ts'Ai-Lun-Paper," presented a story and prepared the way for the lectures and discussions which follow on succeeding Wednesday evenings. Registration is still open.



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Kimberly-Clark Fetes Old Timers at Dinner

NEENAH, Wis. — The second dinner commemorating the seventy-fifth anniversary of Kimberly-Clark Corporation was given Tuesday evening, September 23, at North Shore Golf Club for veteran employes of the Badger-Globe, Lakeview, field service and main office divisions of the company.

Charles Sage, vice-president, who has been with K-C for forty years, was first to receive his certificate as a charter member of the Quarter Century Club. W. H. Clifford, another vice-president, was second.

John Wollwage, Lakeview mill manager, called the names of charter members from his mill; Howard Palmer, those from Badger-Globe; and W. R. Kellett, general superintendent and toastmaster at the dinner, those from the field service and main office.

In addition to the certificate, each member received a $100 bond. Gardenias were presented to all women present.

A total of 101 active members of the corporation who have served 25 years or more of service were welcomed into the club, in the presence of their wives or other relatives. The combined service of the honored guests totals 3,160 years, which, added to the 5,100 officially acknowledged two weeks ago from Kimberly and Appleton Atlas mills brings service of the honored employes to 8,260 years.

During the current week-end another anniversary dinner will be held for employes at the Niagara, Wis., mill, and next week-end Henry Boon and C. W. Nelson will speak at a party at Niagara Falls, N. Y.

Mr. Sage said that the dinner was the corporation's choice as a proper way to acknowledge its 75 years of growth and prosperity.

"The original 40 employes have since increased to 9,000 and you and I know how that long effort showed the way for these modern communities in the course of building an institution of which we are proud. We have come to our business place in life by working together and by nourishing a high morale that will guarantee our future in these same communities as much as any other single thing could do."

Mr. Sage also mentioned that retired employes of the corporation were receiving gifts equal to those distributed at the dinner.

Mr. Clifford spoke about events in years gone by, and joined with Mr. Sage in congratulating the honored guests.

Nekoosa-Edwards Receives Safety Achievement Award

NEKOOSA, Wis.—The Nekoosa-Edwards Paper Company will receive a certificate of achievement in the pulp and paper section of the 1946-47 safety contest for a reduction of almost 50 percent in its accident frequency rate. The National Safety Congress will present the award October 6 in Chicago.

Sixty-five mills were entered in the pulp and paper section. Nepco's achievement was rated on having an accident frequency below the group average and showing a heavy reduction in rate over the previous year's record.

Wisconsin Pumps Air Into Flambeau River

MADISON, Wis.—An experiment that has been in progress during the last three years on the Flambeau river at Park Falls, Wis., with the aim of finding a method to reduce the harmful and unpleasant effects of industrial pollution, involves pumping air into the stream. L. F. Warrick, state sanitary engineer, says that the principle is new and has not heretofore been tested outside of the laboratory. At least another year of experimentation on the Flambeau is expected, he said. The project is financed jointly by Wisconsin sulphite mills, the state health department, and the National Council of Stream Improvement.

Warrick said that the aeration principle can be applied to many other canalized waters where there is a problem of industrial waste pollution, especially during periods of low stream flow. Doubt remains that the method can be considered a complete treatment process, but "it can be regarded certainly as an ameliorating measure to stream sanitation," he asserted. He believes that the method will be especially valuable in those streams where pollution is most harmful at intervals because of low stream flow, because it will help save fish life.

Marathon Housewarming Opens Carton Plant

MENASHA, Wis. — About 4,000 persons toured the new carton manufacturing plant of the Marathon Corporation at the plant "housewarming" September 20 for employes and their families.

Photographic murals of each of the company's plant, finished the previous day, were placed in the lobby of the new plant in time for the open house.

Guides explained operation of machinery and new safety devices in the plant, and the new first aid room, one of the most modern of industrial plants, was open for inspection.

Two orchestras provided old-time and modern music for dancing in the plant. Lunch was served, with 650 pounds of ham and 6,000 bottles of soft drinks being consumed.

It was expected that finishing touches would be completed last week, and that the plant would be in full operation about October 1.

AUSTRALIAN NOTES

PERTH, W. A.—In its effort to conserve dollar funds the Australian Federal Government has banned a number of imports from the United States and Canada. These include: paper of the following types — carbon, cartridge, cellophane (for wrapping), paper for tobacco manufactures, copying, cover and pressings, duplicating, gummed sheets and rolls, marble and foils, vegetable parchment, roofing and sheathing, surface coated, box-makers, fruit wrapping, paper hangings and wallpaper, and paper used for the manufacture of toilet rolls and sheets, carton and container boards, cigarette papers, paper patterns (except master patterns) and plastic pliable sheeting.

Imports of the following lines will be restricted: tissue paper for paper patterns, writing papers and printing paper.

Imports of newsprint for the month of April showed a decided increase, being valued at $1,896,734 (16,033 tons), as compared with the $1,163,659 (9,952 tons) of April, and the $555,744 (5,801 tons) of May, 1946.

Imports of printing papers were: imitation art, 50 tons (U.K., 29, Sweden 12, U.S.A. 9); coated printing, 128 tons (U.K. 125, Canada 3); glazed imitation parchment, 35 tons (Sweden 21, U.K. 14); lithographic machine glazed or one side calendered, 94 tons (Sweden 43, Canada 26, U.K. 25); offset embossed, 73 tons (Canada 45, Sweden 19, U.K. 9); poster and machine glazed, 39 tons (Czechoslovakia 32, U.K. 4, Sweden 3); and other printing papers, 445 tons (Canada 245, Finland 76, U.K. 55, U.S.A. 30, Sweden 21, Netherlands 11, and Norway 7).

Imports of printing paper from the United States during the past five months have been as follows: January, nil; February, 2 tons valued at $825 (at par); March, 38 tons valued at $17,563; April, 3 tons valued at $1,219; and May, 39 tons valued at $13,051.

But for the six months ended December, 1946, principal countries from which Australia imported pulp, paper and stationery were: United Kingdom, $9,662,400; Canada, $9,187,200; the United States, $3,504,000; Sweden, $2,208,000; and New Zealand, $235,200.

At the recent Science Congress held in Perth, Dr. W. E. Cohen, officer in charge of the wood chemistry section of the division of forest products of the Council for Scientific and Industrial Research gave a most interesting review of the scope of the work of that section. He said that he was an executive officer of the Australian pulp and paper industry, and he explained that the cooperative research conference of the Australian pulp and paper industry subsidized the research work being carried out as it aimed at supplying fundamental information concerning the chemistry and structure of wood which would assist the industry in the development of new pulping processes, in producing new products, and in improving existing ones.

Edwards Dunlop & Co., Ltd., wholesale paper merchants who have offices in Sydney, Melbourne and Brisbane, report a net profit of $195,787 for the year 1946-1947, compared with the $189,600 of the previous 12 months. This is the best return since 1941. Dividend remains steady at 10 percent for the ninth successive year. Balance sheet shows the company's paid capital to be $1,804,632; with liabilities at $1,062,787; and tax reserve at $651,677. Assets include: freeholds, $606,629; stocks ($658,838 in 1939), $1,655,937; debtors, $1,877,333; and cash, bonds and shares, $1,741,752. Shares issued at $4.80 (par) are now fetching $15.48.

Berkshire Local Elects Tarmey

LEE, Mass. — Rupert Tarmey has been elected president of the Berkshire Local No. 78, Papermakers Union, at the annual election. The retiring president, Thomas McGinty, was reelected to the office of president but declined the position due to other responsibilities.

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By OGDEN BROWER III

OGDEN BROWER III

Who has found a way to make more calls per day per mile by airplane and motorcycle here sets down a sampling of coverage and costs for his New England territory. Exposed to the flying bug in 1936 after his graduation from Yale, he flew to Texas for his first job with 30 hours experience and a lot of enthusiasm—took him eight days to locate Dallas. Says he got better at it during the war, as Flight Leftenant with the R.C.A.F. Now he is secretary of Gibbs-Brower Inc., and after a bit of experiment has found a way to make his hobby pay—he carries his own ground transport for service to and from airports.

Last month our company made an agreement with Mark Osborne, President of the Osborne Paper Mill Equipment Company of Fulton, N. Y., in which our two companies would work together in the buying and selling of paper mill equipment. This meant that I would have to call on practically all the paper mills in the United States as many times as I could each year. The only way one man can fill that order is to use an airplane.

So our company purchased a Stinson Voyager 165. But the problem of ground transportation presented itself. I had to be completely motorized. The British Paratrooper motorcycle came to my mind. I found out that the British had put on the market a civilian model of their famous midget motorcycle used by the paratroppers during the war. They called it the Corgie. The Corgie, I found out, only weighed 95 pounds, had a top speed of thirty-five miles and went one hundred and twenty miles to the gallon. The Corgie fitted in the Stinson and I could load and unload it very easily, alone.

I started out the next day from Armonk, N. Y., where we base the Stinson. The first landing was made at Hudson Falls, N. Y. When I taxied up after landing, the boys at the airport asked me if I wanted a cab.

"Oh, no, thank you," I said, "I carry my own transportation with me."

This stopped them for a second until they saw the Corgie. From then on I answered questions. They told me the road to take into town and off I buzzed on my first call.

The trip through New England took five days, covered 1,100 air miles and I made 35 calls. For interest, I have broken the trip down. The first column is a list of cities where landings were made. The second column, the air miles between the cities. The third column, the flying time between these cities, taking an average of 120 mph and allowing five minutes for takeoff and five minutes for landing. The fourth column, the road miles between the cities; and the fifth column is the driving time at an average of forty miles per hour. The last column is the calls made at the various stops.

In looking over the itinerary, you will note that the air miles are in most cases much less than the road miles. This, of course, is due to the fact that the airplane flies direct and does not follow the highway around mountains, etc. The gasoline used appears of interest to me. The Stinson burns nine gallons per hour and in 12:45 flying time, burned 104 gallons. The automobile would have gone 1,560 miles and as an average, if it got fifteen miles to the gallon, the gas consumption would have been 104 gallons.

As a summary of flying in comparison with driving, flying relaxes me while I cover 120 miles as the crow flys. As for driving, like most fellows, I drive too fast, and, that my friend, makes it work. At this point, the question of weather comes up. With a small airplane, weather doesn't stop you very often. You may be stopped a day but in most cases, you can get on your way the next.

Of course, flying experience is a great factor. On this point, the RCAF put me in charge of a detachment at Lethbridge, Alberta, which had complete charge of all aircraft ferried over the Canadian Rockies to Vancouver, B.C. Two years of this sort of flying and about 4,000 total flying hours, has given me enough experience in the air to get through in tough weather, but still turn back when it turns out to be the safest thing to do. The best law in flying is: "Don't push it too far and always have a way out in case of bad weather."

We will all admit a flight such as the one I just made into New England would not be possible in winter because of snow on the small fields. However, in the months from November to April, when this trip could not be made, there is the South and West Coast, which I have to cover. Let's hope it works this way. Like the bums and birds, I'll go south in the winter.

As to the airplane, the Stinson is a honey. If I see a Cub in a small field, I can get the Stinson in and out with no trouble.

As to the Corgie, it also is a honey, in fact, all the men I called on showed great interest in it and some men I called on even took a ride on it. They said it gave them quite a thrill.

	Airmiles	Time	Road Miles	Time	Calls
Armonk, N. Y.-Hudson Falls	150	1:25	180	4:30	4
Hudson Falls-Plattsburg	95	1:00	120	3	2
Plattsburg-Sheldon Springs, Vt. ..	25	25	55	1:15	1
Sheldon Springs-Berlin, N. H.	100	1:00	136	3:15	1
Berlin-Rumford, Me.	30	25	50	1:15	1
Rumford-Millinocket, Me.	120	1:10	200	5:00	1
Millinocket-Woodland, Me.	65	40	100	2:30	1
Woodland-Oldtown, Me.	65	40	120	3:00	2
Oldtown-S.Brewer, Me.	15	20	20	30	1
S. Brewer-Belfast, Me.	30	25	35	55	1
Belfast-Waterville, Me.	35	25	45	1:00	1
Waterville-Augusta, Me.	15	20	20	30	2
Augusta-Mechanic Falls, Me.	30	25	40	1:00	2
Mechanics Falls-Brunswick, Me. .	25	20	30	45	1
Brunswick-Portland, Me.	25	20	30	1:45	1
Portland-N. Rochester, N. H.	40	30	60	1:30	2
N. Rochester-Portsmouth, N. H. .	15	20	20	30	2
Portsmouth-Fitchburg, Mass.	60	40	80	2:00	4
Fitchburg-Hinsdale, Mass.	40	30	50	1:15	4
Hinsdale-Armonk, N. Y.	130	1:20	170	4:15	
	1100	12:40	1560	38:40	35

Canadian Stationer Group Will Consolidate Plants

TORONTO, Ont. — Canadian Pad & Paper, Toronto, and subsidiaries, Eaton, Crane & Pike of Canada and Bouvier Envelope, will, in about two months, move into a completely new $750,000 plant in suburban North York township, just northwest of the city, from all three of the parent company's plants in the city.

Consolidation of plant facilities represents only minor immediate gain in capacity and employment, but possible early extension of the new plant is provided for in available land and the building plan, according to Vice-President John Hill. The president and managing-director is Roy C. Hill.

The new building is a one-story structure providing 164,000 sq. ft., plus an office section with 10,000 sq. ft.

Hooker Adds to Sales Staff

NIAGARA FALLS, N. Y. — John M. Glaze has been transferred to the New York sales office of the Hooker Electrochemical Company. During the past year he has been associated with the sales department of the home office in Niagara Falls.

A graduate chemist of Dartmouth, Mr. Glaze joined Hooker in 1942 as a research process foreman and has also been associated with the purchasing department. His territory will include portions of the metropolitan area in both New York and northern New Jersey.

OBITUARY

Gordon E. Emerson

BOSTON — Gordon E. Emerson, 56, treasurer of E. Butterworth & Company, Inc., paper stock dealers, died at his home in Everett, Mass., Friday morning, after an illness of six weeks. Mr. Emerson was widely and favorably known, both in the trade and generally. He had been with the company approximately 35 years. He was a graduate of the Everett High School and Burdett College. He was a member of Palestine Lodge, A. F. and A. M., Everett, and the Everett Square and Compass Club.

His wife, Helen (Long) Emerson, three sons, Gordon E., Jr., Wendell, and Everett, the last-named a student at Harvard College, and a grandson, all of Everett, are living. Funeral services were held at the chapel of J. E. Henderson Company, Everett, September 29.

Walter Fluor

MILWAUKEE, Wis.—Walter Fluor, 62, Oshkosh, treasurer of the Fluor Brothers Construction Company of that city, died September 15 in a Milwaukee hospital after having suffered a cerebral hemorrhage aboard a train. The company built many structures for Fox River Valley paper mills. Funeral services were conducted at Oshkosh, September 18. Mr. Fluor was a prominent Mason and also was a member of the Elks.

Mrs. John A. Hanson

MARINETTE, Wis. — Mrs. John A. Hanson, 54, died Tuesday, September 23, at a Rhinelander, Wis., hospital, where she had been a patient since September 13, when she suffered a stroke. She had been attending a social function held in connection with a business meeting attended by Mr. Hanson, who is manager of the Badger Paper Mills, Inc., plant at Peshtigo.

A daughter and a son survive, in addition to Mr. Hanson. Funeral services were conducted here September 26, and burial was at Wausau, Wis.

F. C. Sherbondy

AKRON — F. C. Sherbondy, vice-president and treasurer of the Biggs Boiler Works Company, passed away September 11, at People's Hospital after a year's lingering illness. He had been associated with the Biggs organization for 45 years.

SUNOLITH
LITHOPONE
ASTROLITH
LITHOPONE
R.G. GRADE
ZOPAQUE
TITANIUM DIOXIDE
★
Proved results—for surface coating or beater addition

The recognized standard of Quality Pigments for The Paper Industry

THE CHEMICAL & PIGMENT COMPANY
Division of
The Glidden Company
BALTIMORE, MD. COLLINSVILLE, ILL.
OAKLAND, CALIF.

Dively Named Head Of Harris-Seybold

CLEVELAND—George S. Dively, vice-president and general maanger of the Harris-Seybold Company since 1944, has been elected president and general manager of the firm to succeed the late Alfred Stull Harris. Dively has been associated with the firm for more than ten years, serving as secretary-treasurer prior to 1944. He has been a member of the board of directors since 1941.

Before joining Harris-Seybold, Dively had an unusually broad experience in engineering, production, sales and finance. His experience included positions with the Wagner Electric Corporation, North American Refractories Company, Carrier Corporation, and Republic Steel Corporation.

The new president has had an important part in the expanded Harris-Seybold program, which has already resulted in a rate of production of two and one-half times pre-war physical volume. In this program, engineering, sales, production, and all management activities have been geared to meet the high demand for Harris offset presses and Seybold paper cutters.

Dively is a graduate of the Engineering School of the University of Pittsburgh and of the Harvard Graduate School of Business Administration. Among numerous association activities he was recently elected a vice-president of the American Management Association.

Roger D. Williams, son-in-law of the late A. S. Harris, was elected to the board of directors. Directors re-elected were Mitchell, Dively, A. T. Colwell, W. C. Dunn, H. A. Porter, E. D. Rogers, N. O. Scourfield, J. W. Valiant, and L. P. Wasserman.

Hjelm and Wagner Follow Allen in Chicago

SPRINGFIELD, Mass.—M. N. Allen's resignation "after long service," from the Chicago sales staff of Package Machinery Co., here, brings in its wake a number of changes in the firm's selling force. Mr. Allen will make his temporary residence in Saginaw, Mich.

Chicago sales duties will now be handled by Ernie Hjelm, formerly in charge of the Atlanta office, and Edward Wagner, who was recently transferred to Chicago from the main plant here.

Mr. Hjelm will handle accounts previously serviced by Mr. Allen. He will cover Chicago, Michigan, Wisconsin, Northern Illinois, Iowa, Minnesota, North Dakota and Montana. Mr. Wagner will cover Chicago, Indiana, Southern Illinois, part of Kentucky, Missouri, Arkansas, Oklahoma, Louisiana west of the Mississippi, and Texas.

George Woody assumes the duties filled by Mr. Hjelm in Atlanta.

Gardner-Denver Opens Three New Branch Offices

CHICAGO — Rapidly increasing demand for Gardner-Denver products has necessitated the opening of three new branch offices, to be located in New Orleans, Cleveland and Kansas City, according to Gardner-Denver officials. These new sales and service offices will bring the total of domestic branch offices to twenty-nine. The new branch office in New Orleans, at 1034 Camp Street, was opened on September 1, with M. B. Morrisette as branch manager.

The new Cleveland office was opened October 1 at 8015 Carnegie Avenue with R. A. Williams as manager. It is planned to open the Kansas City office at 2805 Main Street on October 15. E. C. Wallace will be branch manager.

These new branch offices will sell and service the Gardner-Denver line of rock drills, pumps, compressors, mine car loaders, hoists and drilling engines.

A. C. Beeson, formerly manager of the branch in Detroit, has been called to the main offices in Quincy, Ill., and the management of the Detroit office has been assigned to G. A. Murphy.

Foster Wheeler Club Honors Old Timers

NEW YORK—The Foster Wheeler 25 Year Club recently honored those with a quarter century or more of service with a day's outing in New York and Carteret, followed by a dinner. The club's membership is over 200 and the oldest member has been with the company for 50 years. Members were taken on a tour of inspection of the Carteret, N. J., plant, visited headquarters in New York, attended a baseball game and dined at Rosoff's where short talks were made by chairmen of the New York, Carteret and Dansville chapters, and Harry S. Brown, chairman of the board; David McCulloch, executive vice-president; and Pell W. Foster, vice-president.

General Mills Will Offer Allyl Starch

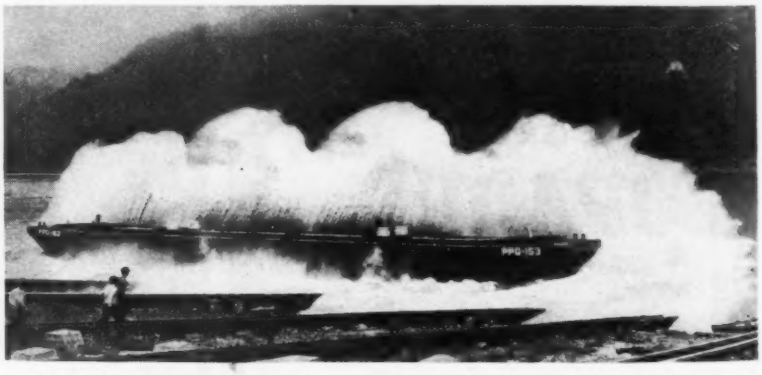
MINNEAPOLIS — Allyl starch, developed by Dr. E. Yanovsky and his associates at the U. S. Department of Agriculture's Eastern Regional Research Laboratory in 1944, is now being manufactured on a pilot plant scale by General Mills Research Laboratories. The company is making pint, quart and gallon samples available to interested firms for commercial evaluation.

Studies conducted at the Eastern Regional Laboratory indicate that allyl starch faces a promising future as a synthetic coating, shellac substitute, protective and decorative coating on wood, glass and metal, as a lacquer and varnish for furniture, a thermosetting adhesive, printing ink base, textile finish and leather dressing. It also may find use as greaseproofing for paper, for paper impregnation and in nail polishes. Since it forms a rigid plastic when vulcanized, it has attracted interest as a laminating agent.

General Mills' allyl starch is an unsaturated ether of starch which contains approximately 1.7 allyl groups per glucose unit. It is soluble in alcohols, ketones, esters halogenated hydrocarbons, nitroparaffins, ethers, benzene and in other aromatic hydrocarbons when some hydrogen bond-forming solvent is present. It is insoluble in aliphatic hydrocarbons.

Ordinarily, allyl starch films must contain from 10 to 20 percent of a plasticizer to prevent brittleness. But when cured, they are hard, have excellent gloss and are resistant to organic solvents. Their water resistance may be improved by baking them for one hour at from 130 to 150° C. without a catalyst.

General Mills produces its allyl starch by a simplified process developed by Dr. J. Robert Roach, Robert Nordgren and Robert J. Foster of the company's Research Laboratories.



One of eight new chlorine tank barges—first ever specifically designed and built for such service—is launched into the Ohio River at Dravo Corporation's Neville Island shipyard where they were constructed. Columbia Chemicals Division of the Pittsburgh Plate Glass Co., and an affiliate, Southern Alkali Corporation, will use the fleet of barges to effect more economical delivery of bulk chlorine to large users along the inland waterways.

TIME

...measured in service and performance!

No one can say how long a time, measured in days, months or years, a certain valve will give satisfactory performance. Naturally it will depend on the service conditions—how much the valve is operated and especially the kind of media it controls.

But we can say positively that a valve of absolutely correct design and materials for the conditions under which it operates will last far longer and require much less maintenance than a valve which does not fully meet these requirements.

That's the kind of valves you get when you standardize on the Powell Line for all your flow control requirements. Because through more than a century of making valves—and valves only Powell has concentrated on developing a complete line of valves—in bronze, iron, steel and the widest range of corrosion-resistant materials ever used in making valves—to meet every requirement of modern industry.

Fig. 375—200-pound Bronze Gate Valve. Screwed ends, inside screw rising stem, union bonnet and renewable, wear-resisting "Powellium" nickel-bronze disc.

Fig. 1460—Iron Body Bronze Mounted "Master Pilot" Gate Valve. Screwed ends, rising stem, bolted flanged bonnet and taper wedge solid disc. Also available in All Iron.

Fig. 1706—200-pound Bronze Globe Valve with screwed ends, union bonnet, renewable, specially heat treated stainless steel seat and regrindable, renewable, wear-resisting "Powellium" nickel-bronze disc.

Fig. 560—200-pound Bronze Regrinding Horizontal Swing Check Valve. Screwed ends, screwed-on cap and regrindable, renewable bronze disc.

Fig. 1793—Large 125-pound Iron Body Bronze Mounted Gate Valve. Made in sizes 2" to 30", inclusive. Has outside screw rising stem, bolted flanged yoke and taper wedge solid disc. Taper wedge double disc can be provided in sizes 2" to 12", inclusive.

Powell Valves for handling black liquor, white liquor, green liquor, etc., are available in all iron, iron body with bronze trim and iron body with special alloy trim.

The Wm. Powell Co., Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES

IMPORTS

NEW YORK IMPORTS

WEEK ENDING SEPT. 27, 1947
SUMMARY

Newsprint	13,226 rolls
Wallpaper	4 cs., 31 pkgs.
Printing Paper	329 bls.
Wrapping Paper	172 rolls
Gummed Paper	72 cs.
Litho Transfer Paper	20 cs.
Wafer Paper	4 cs.
Miscellaneous Paper	6 bls., 15 cs.

NEWSPRINT

R. A. Olsen Co., G.T.D., Donnacona, 366 rolls.

H. G. Craig Co., Newscarrier, Donnacona, 357 rolls.

Madden Reeve Angel & Co., Mormackite, Helsingfors, 1331 rolls.

R. A. Olsen Co., A.C.D., Donnacona, 378 rolls.

H. G. Craig Co., G.D.D., Donnacona, 356 rolls.

R. A. Olsen Co., Kermic, Donnacona, 372 rolls.

News Syndicate Co., Brian Thorold, 2030 rolls.

News Syndicate Co., Kay, Thorold, 2071 rolls.

News Syndicate Co., Charles Nordhoff, Baie Comeau, 5965 rolls.

WALLPAPER

American Express Co., De Grasse, Havre, 3 cs.

F. C. Gerlach, De Grasse, Havre, 1 cs.

W. I. Chudleigh, Mormackite, Copenhagen, 31 pkgs.

PRINTING PAPER

Madden Reeve Angel & Co., Mormackite, Helsingfors, 329 bls.

WRAPPING PAPER

Jay Madden Corp., Mormackite, Helsingfors, 172 rolls.

GUMMED PAPER

B. F. Drakenfeld & Co., American Traveler, Liverpool, 72 cs.

LITHO TRANSFER PAPER

International Printing Ink Div. of Interchemical Corp., Lookout, Hong Kong, 20 cs.

WAFER PAPER

Delft Packing & Trading Co., Aalsdyk, Rotterdam, 4 cs.

MISCELLANEOUS PAPER

Gondrand Bros., Whirlwind, Havre, 10 cs.

W. Dixon, Whirlwind, Havre, 5 cs.

Air International Express Agency, Queen Mary, Southampton, 6 bls.

RAGS, BAGGINGS, ETC.

Irving Trust Co., Hav, Piræus, 80 bls. old scrap bagging; 57 bls. old light hessian bagging.

(———), Coastal Defender, Havana, 65 bls. old rags.

Castle & Overton, Inc., American Traveler, Glasgow, 116 bls. grey linen thread waste.

Padawer Co., Lookout, Shanghai, 100 bls. cotton waste.

C. Comiter Co., Lookout, Shanghai, 200 bls. picker waste.

Kauders Steuber Co., Kirov, Leningrad, 830 bls. cotton linters.

1st National Bank Chicago, Kirov, Leningrad, 1719 bls. picker waste.

Continental Bank Trust Co., Saginaw Victory, Antwerp, 57 bls. old bagging.

Royal Manufacturing Co., Saginaw Victory, Antwerp, 143 bls. cotton waste.

R. L. Pritchard, Exminster, Calcutta, 75 bls. net cuttings; 125 bls. paperstock.

(———), Exminster, Calcutta, 122 bls. paperstock.

OLD ROPE

(———), Marwarri, Calcutta, 446 bls. old hemp rope cuttings.

Smith & Bird, Marwarri, Calcutta, 95 bls. old hemp rope cuttings

GLUESTOCK

National City Bank, Montevideo, Recife, 92 bls. dry gluestock.

PHILADELPHIA IMPORTS

WEEK ENDING SEPT. 27, 1947

Madden Reeve Angel & Co., Mormackite, Helsingfors, 421 rolls newsprint.

Victory Shipping Co., Mormackite, Copenhagen, 2 cs. printing paper.

Washington Finds Bars In Export Prospects

WASHINGTON—Special purpose paper products, such as cigarette papers, glassine, waxed papers and celoophane, are handicapped in export to Australia and New Zealand by a wide range of trade and other barriers, it is indicated in a study of those trans-Pacific markets just released by the Department of Commerce.

There is considered to be a fair market in New Zealand for United States-manufactured glassine paper, in which the United States gained an entry during the war years. However, Canada likewise gained a foothold there in the war period, and the extent of the American market will depend, it is pointed out, on the ability of Canada to hold its own gains.

There are no New Zealand manufactures of glassine paper, but imports of this product are subject to a primage duty of three percent ad valorem, regardless of source, and there is a sales tax of 20 percent of the sales value.

A major obstacle to American sales appears to be however, that an import license is required, with the policy of the New Zealand authorities to grant a license for importations from the United States or other dollar sources, only when the goods are not obtainable from United Kingdom or other Sterling-bloc sources.

New Zealand produces about 3,000,000 pounds of waxed paper per year, and has no imports of this kind, the Department reports. Any import however, would be subject to 20 percent ad valorem duty, a surtax, and a 20 percent sales tax.

While there have been no cellophane imports in recent times, these also are subject to the above general policy, it is said. In 1945, the last year for which figures are given, United States cellophane comprised about 18 percent of New Zealand imports, however.

Western Australia produces no cigarette paper, and prior to the recent war, paper used there was imported from France, British suppliers later taking over the market when France was cut off by war. Cigarette paper of United States manufacture, though higher in cost than the British product, is reported to be regarded favorably in the country however, as having less acidity than the British type. Again, the policy as to imports from non-Sterling areas is an obstacle. This same policy affects glassine paper sales by United States producers, apart from other difficulties, such as duties, etc.

Cellophane is imported into Western Australia, it is stated, from the United Kingdom, under a license agreement with the United States parent manufacturing company, but otherwise, the same import restrictions on no-Sterling area products, discourage direct sales of United States-made cellophane.

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, October 1, 1947.

The paper market retains its firm steady pulse without any indication of anxiety concerning possible disturbing effect in the fourth quarter. Generally it is felt that there will be no noticeable price change nor any easing of the supply and demand before the first quarter of 1948. At that time, the market might become sensitive to whatever general business conditions develop as a result of the present inflationary period, the first effect coming through a change in advertising tempo.

The Department of Commerce of the United States expects no substantial increase in the supply of newsprint until 1949 or 1950, the supply being still far short of the demand. North American production, it said, was eight percent ahead of the first seven months of last year, with Canada showing a nine percent increase. However, Canadian production in August was but 1.92 percent ahead of the previous August, with shipments exceeding production by 3,000 tons, resulting in a corresponding decrease in Canadian stocks held by its manufacturers. Shipments to the United States constituted 82.04 percent of the August production, 5.98 percent was consumed in Canada, and the balance went to overseas customers.

If this shipment of 55,455 tons could be maintained it would be a step on the way to alleviating the present shortages, particularly in France and Holland where it is reported the problem is to get the mills operating at full capacity — which is involved in the European coal shortage. Such a newsprint shortage becomes the more serious when it is considered that there is not enough newsprint to present essential information about today's current affairs to the people.

The index of general business activity for the week ended September 20 eased to 141.4 from 141.7 in the preceding week, compared with 132.9 for the corresponding week in 1946. The index of paperboard production declined to 165.9 from 171.3 in the preceding week, compared with 154.6 for the corresponding week in 1946.

Paper production for the week ended September 20 was estimated at 108.0 percent compared with 106.9 (revised figure) for the previous week, with 105.8 for the corresponding week in 1946, with 94.3 for 1945, and with 91.9 percent for the corresponding week in 1944.

Paperboard production for the week ended September 20 was 101.0 percent of capacity, compared with 103.0 percent for the preceding week, with 100.0 for the corresponding week in 1946, with 93.0 for 1945, and with 96.0 percent for the corresponding week in 1944.

Woodpulp

The pulp market has not eased in the last month, although domestic production is at high level and imports are increasing. The geenral outlook regarding prices and supply is described as "confused." There are those who believe the answer lies in erection of more independent American pulp mills, while others think it is in the construction and operation of pulp mills jointly owned and operated by the 300 or more converting mills, and that fundamental adjustments within the industry may occur before more market pulp becomes available.

Contrary to the many rumors of price change, especially in the Canadian market and from overseas sources, our best information is that there is no change and that none is contemplated for Canada for the fourth quarter, though there may be isolated exceptions. It will not be surprising if some advances come from the Swedish and Finnish markets. There is no news at present to support rumors, however.

Waste Paper

The fourth quarter's demand for waste paper to meet the demands of the nation's consuming mills is expected to be so far in excess of collections and inventories that new efforts will be required to stimulate collections. Avtivities along such lines as school collections and Boy Scout programs are recommended before it is too late. The mills are ready to buy clean, well-packed stock for inventory.

The market remains firm and is specially good on corrugated paper and hard white cuttings. It has eased considerably on over-issue newspaper for export where there are no dollars to purchase it abroad.

Mills Resist Pressure In Midwest Prices

CHICAGO — On September 23 paper mills operating in this area raised their price for No. 1 mixed paper by $3 a ton, according to local reports which also indicated that there was some confusion in the market over the quotations on No. 1 old corrugated. An effective increase in demand for mixed papers, which had been in none too good demand all during the past few months, resulted in an increase in mixed paper prices to $15 a ton in truckloads or carloads, compared with the $12 price which had been in effect for several months.

Whether or not the mills were justified in boosting the price of corrugated was a disputed point in this locality. On one hand, certain mills were offering $34 a ton, insisting that the higher price was merited because of shortages. Other mills were reported to be claiming that supplies were adequate and were quoted as saying that they would withdraw from the market rather than pay the increase over the $30 price. Because of these variations in attitudes and until the situation is clarified somewhat, dealer quotations on old containers remained unchanged at 90 cents to $1 hundredweight.

Old news remained steady at $18 a ton in truckloads and $20 a ton in railroad cars and the old news was coming into the mills in ample quantity, according to local reports. Dealer prices for folded news was firm at 35 to 40 cents a hundredweight.

Hoosier Trade Stays At Its Steady Pace

INDIANAPOLIS, Ind.—Cooler weather has apparently had little effect on paper demand. Of course, demand for summer specialties slipped after the Labor Day holiday and little is expected from now on until next spring. But, demand for paper towels, cleaning tissues and paper cups continues in fair volume.

During the summer months there was a noticeable narrowing of the gap between supply and demand and at the present time inventories in local warehouses and at factories are rather higher than they have been for a long time. There is little probability, however, according to the local trade, that supply will entirely catch up with demand until next year.

Building paper and roofing demand continued heavy the last week with good building weather and is expected to keep up the pace until severe cold halts operations. Some wholesalers have been having difficulty in the last month in securing all the material they could sell, but the situation as a whole has not been bad. The high cost of materials in the building field has curtailed some construction, but the volume is rather high in view of conditions.

Fine paper demand has continued heavy. This city has two large textbook publishing houses and their business and consumption of book print has been enormous all during the summer. Orders continue to be unfilled because of lack of paper and production facilities.

Box and container factories are preparing for the holiday trade and have plenty of orders. There continues to be a scarcity of labor but this is not as marked as it was this time last year.

Rag demand was steady last week with emphasis on the better grades. Waste paper demand was heavy and likely will remain so until the first of a year at least.

PRICES

With the elimination of price controls on paper, pulp, rags and other materials, the quotations given below once more become indicative of trends in an open market. At the moment they can be of little more, for, while some volume business still is being done under contract at the figures given below, fluctuations representing special conditions are too varied and too frequent to permit prices to be given as representing a wholly stabilized market.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	$87.50	to	$90.00
Sheets	$109.00	"	—
Kraft—per cwt.—Carload Quantities			
Zone A, Delivered 40 lb. base weight			
Superstandard Wrapping	$7.00	to	—
No. 1 Wrapping	6.50	"	6.75
Standard Wrapping	6.00	"	6.25
Standard Bag	5.75	"	6.25
Tissues—Per Ream 24x36 (480) 10 lb. Zone 1.			
Wh. No. 1 Frd.	$1.65	to	$1.72
Wh. No. 1 M. G.	1.65	"	1.72
Wh. No. 1½	1.48	"	—
Wh. No. 2	1.55	"	—
Kraft Anti-Tar	1.38½	"	—
Kraft Unbl.	1.85	"	—
Manila No. 2	1.62	"	—
Toilet—Per Case of 100 rolls—1 M Sheets.			
Unbleached	$5.50	to	$6.40
Bleached	6.50	"	7.60
Paper Towels—Per Case of 3750—			
Zone 1.			
Wh. Jr. M'tif'd 9¼x9½			$4.85
Br. Sr M'tif'd 10x12			3.45
Br. Jr. M'tif'd 9½x9¾			2.95
Br. Jr. Sgl. fold 10x10¾			3.10
Manila—per cwt.—C. l. f. a.			
No. 1 Jute Tag			$13.80
Reg. Jute Manila			13.25
No. 1 Manila			9.75
Boards, per ton—			
News	$92.50	"	—
Chip	90.00	"	—
Sgl. Mla. L.l Chip*	102.50	"	—
White Pat. Coated*	120.00	"	—
Kraft Liners 42 lb.	95.00	"	—
Binders Boards	126.00	"	—

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2 50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1: Rag Content Bonds and Ledgers—

White, Assorted Items

Bonds, per cwt.

	Carton	4 C't'n	Ton
100% Rag Ext. No. 1	$55.00	$50.00	$48.00
100% Rag	46.50	43.00	41.25
75% Rag	35.00	32.50	31.50
50% Rag	31.50	28.75	27.50
25% Rag	28.00	25.50	24.50

Ledgers, per cwt.

100% Rag Ext No. 1	$54.25	$50.00	$48.00
100% Rag	46.25	42.50	40.75
75% Rag	36.00	33.25	31.75
50% Rag	31.00	28.00	27.00
25% Rag	27.25	24.75	23.75

Sulphite Bonds and Ledgers—

White, Assorted Items

Bonds, per cwt.

No. 1	$19.25	$17.50	$16.80
No. 2	18.25	16.50	16.00
No. 4	16.75	15.25	14.50

Ledgers, per cwt.

No. 1	$20.25	$18.35	$18.60
No. 2	19.25	17.50	16.80
No. 4	17.75	16.25	15.50

Free Sheet Book Papers—

White, Cased Paper

(Per cwt.)	Case	Ton
No. 1 Glossy Coated	$19.40	$18.60
No. 2 Glossy Coated	18.15	17.35
No. 3 Glossy Coated	17.65	17.00
No. 1 Antique (Water marked)	$15.90	$15.25
No. 2 Offset	16.00	14.75
A Grade E. F.	13.90	13.30
A Grade S. & S. C.	14.40	13.70
B Grade E. F.	Nominal	
B Grade S. C.	Nominal	
C Grade E. F.	Nominal	
C Grade S. C.	Nominal	
D Grade E. F.	Nominal	
D Grade S. & S. C.	Nominal	

Wood Pulp

Domestic mill prices delivered with former OPA freight allowances.

	Per Short ADT
Groundwood	$75.00 to $80.00
Unbleached Sulphite	115.00 " 117.00
Bleached Sulphite	121.00 " 125.00
Bleached Soda	115.00 " 120.00
Unbleached Kraft	112 50 " 120 00
Southern Kraft	102.50 " 112.50

Canadian mill Prices delivered with freight allowances unless otherwise specified:

	Per Short ADT
Select Unbleached Kraft (no freight allowance)	115.00 " —
Unbleached Sulphite	115 00 " 117 00
Bleached Sulphite	125.00 " 155.00
Glassine Unbleached Sulphite (no freight allowance)	112.00 " —
Bleached Soda	105.00 " 115.00
Groundwood	75.00 " 80.00
Sideruns Pulping News	75.00 " 80.00
Hardwood and Specialty Grades	Nominal

Swedish Quotations

Ex. dock, New York

	Per Short ADT
Bleached Kraft	$150.00 to 156.00
Bleached Sulphite	151.00 " 158.50
Unbleached Sulphite	121.00 " 131.00
Unbleached Kraft	116.00 " 126.00

Finnish Quotations

Ex. dock, New York

	Per Short ADT
Bleached Sulphite	$175.00 to —
Unbleached Sulphite	145.00 " 150.00
Unbleached Sulphate	140.00 " —

New Domestic Cotton Cuttings

(Prices delivered Mill Plus Dealer's Commission)

White Shirt	$11.50 to	$12.00
Light Silesias	7.50	
Unbleached Muslin	11.50 "	12.00
White Back Blue Overalls	8.50	
Blue Overalls	7.75	
Unbl. Fancy Shirt	5.00 "	5.50
Light Percales	6.00 "	6.50
Light Prints	5.25 "	5.95
Washables	4.00	
Bleachable Khaki	6.00 "	6.50
Unbleachable Khaki	5.50 "	6.00
Cottonades	5.00 "	5.50

Old Domestic Cotton Rags

(F.O.B. Shipping Point Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites Repacked	$4.50
No. 1 Whites Miscellaneous	4.25
No. 2 Whites Repacked	4.00
No. 2 Whites Miscellaneous	3.50
Blue Overalls	3.75
Thirds and Blues Repacked	3.00
Thirds and Blues Miscellaneous	2.50
No. 1 Roofing Rags	1.65
No. 2 Roofing Rags	1.55
No. 3 Jute Bagging	1.45
No. 4 Brussels and hard back carpets	1.45
No. 5A Roofing Rags	1.45

New Foreign Cotton Cuttings

(Prices delivered Mill)

	Per 100 lbs.
New Dark Cuttings	$6.00 to —
New Mixed Cuttings	6.50 " —
Light Silesias	9.00 " 10.00
Light Flannelettes	8.00 " 9.00
New White Cuttings	13.00 " 15.00
Fancy Shirt Cuttings	9.00 " 10.00
Light Prints	8.00 " 10.00
Bleachable Khaki, No. 1	7.00 " 7.50
Unbl. Khaki, No. 1	6.25 " 6.75

Old Foreign Rags

(F.O.B. New York)

	Per 100 lbs.
No. 1 White Linens	$14.00 to 16.00
No. 2 White Linens	12.00 " 13.00
No. 3 White Linens	8.00 " 9.00
No. 4 White Linens	8.00 " 9.00
No. 1 White Cottons	10.00 " 12.00
No. 2 White Cottons	8.00 " 9.00
No. 3 White Cottons	6.50 " 7.00
No 4 White Cottons	5.00 " 5.50
Extra Light Prints	7.50 " 8.00
No. 1 New Light Prints	6.25 " 6.75
Med. Light Prints	5.25 " 5.75
Dutch Blue Cottons	5.25 " 5.50
Checks and Blues	4.00 " 4.25
Linsey Garments	3.00 " 3.75
Dark Cottons	2.50 " 3.00
Old Shopperies	2.50 " 3.00
New Shopperies	2.50 " 3.00

Bagging

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny, No. 1	$4.75 to 5.00
Domestic Gunny, No. 1	4.25 " 4.50
Light Wool Tares	4.50 " 4.75
Heavy Wool Tares	4.75 " 5.00
Bright Bagging	4.25 " 4.50
Foreign Manila Rope	6.00 " 7.00
Domestic Manila Rope	5.75 " 6.50
Jute Strings	4.50 " 5.00
No. 1 Sisal Strings	5.50 " 6.00
Mixed Strings	1.75 " 2.50

Waste Paper

Prices to Mills

(Dollars Per Ton)

F.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	$125.00 to		$135.00
No. 1 Hard White Envelope Cuts	110.00 "		120.00
No. 1 Hard White Shavings, unruled	110.00 "		120.00
No. 1 Hard White Shavings, ruled	100.00 "		120.00
Soft White Shavings, one cut	110.00 "		120.00
No. 1 Soft White Shavings	90.00 "		100.00
Soft White Shavings, Misc.	80.00 "		90.00
No. 1 Fly Leaf Shavings	55.00 "		60.00
No. 2 Fly Leaf Shavings	50.00 "		55.00
No. 1 Groundwood Fly Leaf Shavings	30.00 "		33.00
No. 2 Mixed Groundwood Fly Leaf Shavings	(nominal)		
Mixed Colored Shavings	(nominal)		
Mixed Groundwood Colored Shavings	(nominal)		
Overissue Magazines	(nominal)		
No. 1 Heavy Books & Magazines	25.00 "		30.00
Mixed Books	15.00 "		20.00
No. 1 White Ledger	75.00 "		85.00
New Manila Envelope Cuttings, one cut	100.00 "		110.00
New Manila Envelope Cuttings	65.00 "		75.00
Extra Manilas	35.00 "		40.00
Mixed Kraft, Env. & Bag Cuttings	75.00 "		85.00
Kraft Envelope Cuttings	100.00 "		105.00
Triple Sorted, No. 1 Brown Soft Kraft	65.00 "		75.00
New 100% Kraft Corrugated Cuttings	75.00 "		85.00
No. 1 Assorted Old Kraft	40.00 "		50.00
New Jute Corrugated Cuttings	27.00 "		—
Old 100% Kraft Corrugated Containers	(nominal)		
No. 1 News	17.00 "		19.00
No. 1 Mixed Paper	15.00 "		17.00
Box Board Cuttings	16.00 "		—
White Blank News	75.00 "		80.00
Overissue News	(nominal)		
Old Corrugated	30.00 "		32.00
Mill Wrappers	22.00 "		25.00

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—India	.26	to	.29
Fine Polished—Fine India	.31	"	.35
Unpolished—			
Paper Makers	.20	"	.26
Tube Rope	.22	"	.27½
Wrapping	.26	"	.33½
Cotton	.70	"	—
(Hard Fiber)			
Mex. Sisal	.21	"	.24
Manila	.33	"	—
(Hemp)			
Polished Hemp	.63	"	—

PHILADELPHIA

Domestic Rags (New)

(F.O.B. Eastern Shipping Point)

Shirt Cuttings—			
New White No. 1	.11	to	.12
New White No. 2	nominal		
Light Silesias	.07½	"	.08
Black Silesias, soft	.06½	"	.07
New Unbleached	.10½	"	.11¼
Washable Prints	.06½	"	.07
Washable No. 1	.05	"	.05½
Blue Overall	.07½	"	.08
Cottons—According to grades—			
Washable Shredding	.03½	"	.04
Fancy Percales	.06¾	"	.07¼
New Black Soft	nominal		
Khaki Cuttings—			
Unbleachable Cotton Cuttings	.06	"	.06½
Bleachable Cotton Cuttings	.07	"	.07½
Men's Corduroy	.05½	"	.06
Ladies' Corduroy	.05	"	.05½
Cottonades	.05½	"	.06

Domestic Rags (Old)

(F.O.B. Eastern Shipping Point)

White No. 1—Repacked	4.50	to	5.00
Mixed White	4.00	"	4.25
White No. 2—Repacked	3.50	"	3.75
Thirds and Blues—			
Miscellaneous	2.25	"	2.50
Repacked	2.75	"	3.00
Roofing Stock—			
Foreign No. 1	nominal		
Domestic No. 1	1.85	"	1.90
Domestic No. 2	1.75	"	1.80
Roofing Bagging	1.65	"	1.70
Old Manila Rope	6.50	"	6.50

Bagging

(F.O.B. Eastern Shipping Point)

Gunny No. 1—			
Foreign	nominal		
Domestic	4.50	to	5.00
No. 1 Clean Bright—Sisal Strings	.04	"	.04½
No. 2 Clean Bright—Sisal Strings	.03	"	.03¼
Sisal Jute	.02¾	"	.03
Scrap—			
No. 1	4.25	"	4.75
No. 2	1.75	"	2.00

Wool Tares, heavy...	4.75	"	5.00
New Burlap Cuttings	6.00	"	6.50

Old Papers

(F. o. b. Phila.)
Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	to	$115.00
No. 1 Hard White Shavings, unruled..	100.00	"	—
Soft White Shavings, one cut	90.00	"	95.00
White Blank News..	70.00	"	75.00
Soft White Shavings.	80.00	"	—
No. 1 White Ledger.	80.00	"	85.00
Ledger, Colored	67.00	"	70.00
No. 1 Heavy Books & Magazines	30.00	"	32.00
Overissue Magazines..	nominal		
New Manila Envelope Cuttings	80.00	"	—
No. 1 Assorted Old Kraft	60.00	"	65.00
No. 1 Mixed Paper..	15.50	"	—
Box Board Cuttings..	15.00	"	—
Kraft Corrugated Cuttings	90.00	"	100.00
Old Corrugated	30.00	"	35.00
Overissue News	30.00	"	—
No. 1 News	18.00	"	20.00

BOSTON

Old Papers

(F. o. b. Boston)
Mill Prices, Baled

No. 1 Hard White Shavings, unruled..	7.00	to	8.00
No. 1 Hard White Shavings, ruled	7.00	"	8.00
Soft White Shavings, Misc.	6.25	"	6.50
No. 1 Fly Leaf Shavings	1.65	"	1.80
No. 2 Fly Leaf Shavings	2.00	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	1.25	"	1.50
Mixed Colored Shavings	2.50	"	2.75
New Manila Envelope Cuts, one cut	5.00	"	5.50
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft.	3.50	"	3.75
Mixed Kraft Env. & Bag Cuttings	3.75	"	4.00
Kraft Envelope Cuttings	3.75	"	4.00
No. 1 Heavy Books & Magazines	2.50	"	2.60
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards ..	4.25	"	4.50
Groundwood Tabulating Cards	1.35	"	—
White Blank News..	1.65	"	—
No. 1 Assorted Old Kraft	3.50	"	—
No. 1 Mixed Paper..	—	"	.95
Overissue News	1.50	"	1.75
Box Board Cuttings..	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers.	1.75	"	—
Old Corrugated Containers	1.50	"	—
Jute Corrugated Cuttings	1.07½	"	—
Paper Strings	2.25	"	2.50

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	—	to	4.75
Domestic	—	"	4.75
Sisal Rope No. 1	6.00	"	—
Sisal Rope No. 2	5.50	"	—
Mixed Rope	5.25	"	—
Mixed Strings	2.00	"	2.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	6.25	"	—
Soft Jute Rope	5.00	"	5.25
Jute Carpet Threads.	6.00	"	—
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	—	"	4.75
Domestic	—	"	4.87½
South America	5.25	"	—
Wool Tares—			
Foreign	4.75	"	—
Domestic	4.75	"	—
Aust. Wool Pouches..	5.00	"	5.25
New Zealand Wool Pouches	5.25	"	5.50
New Burlap Cuttings	6.00	"	6.50
Heavy Baling Bagging	5.25	"	5.75
Paper Mill Bagging..	3.50	"	3.75
No. 1 Roofing Bagging	1.75	"	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	.08	to	—
Fancy Percales	.07½	"	.08
New White No. 1..	.11	"	.11½
New Light Flannelettes	.08	"	.08½
Canton Flannels, Bleached	.10	"	.11
Underwear Cutters, Bleached	.10	"	.11
Underwear Cutters, Unbleached	.11	"	.12
Silesias No. 1	.08	"	.08½
New Black Silesias..	.05	"	—
Red Cotton Cuttings.	.05	"	—
Blue Overalls	.08½	"	.09
Soft Unbleached	.11	"	.12
Blue Cheviots	.08½	"	.09
Fancy	.06	"	—
Washable	.06	"	—
Khaki Cuttings	.06½	"	.07¼
Corduroy	.03½	"	—
Khaki Canvas	.06¼	"	.06½
B. V. D. Cuttings	.10½	"	.11¼

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	to	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues,			
Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	2.00	"	—
No. 2	1.75	"	2.00
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A..	1.35	"	—
Quality B..	1.20	"	—
Quality C..	.95	"	—
Old Manila Rope	6.00	"	—

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)
Mill Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	$110.00	to	$120.00
No. 1 Hard White Shavings, unruled..	105.00	"	115.00
No. 1 Soft White Shavings	80.00	"	95.00
No. 1 White Ledger..	55.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	43.00
White Blank News..	43.00	"	49.00
Mixed Kraft Env. & Bag Cuttings	75.00	"	85.00
No. 1 Assorted Old Kraft	45.00	"	55.00
Overissue News	28.00	"	—
No. 1 News	18.00	"	20.00
No. 1 Mixed Paper..	12.00	"	15.00
Old Corrugated	30.00	"	34.00
Mill Wrappers	22.00	"	—

MARKETS

BLANC FIXE—Market steady with deliveries fair and supplies adequate. Pulp is currently quoted at $55 per ton, in barrels, car lots, at works; and $60 less car lots same basis.

BLEACHING POWDER—Supplies continue tight although demand has eased somewhat. Shipments improved. Quotations are unchanged. Prices on bleaching powder range from $3 to $3.75 per 100 pounds.

CASEIN—Current prices on processed acid precipitated casein are quoted around 24 to 26 cents per pound for domestic grades and 28 to 32 cents for imported grades f.o.b. shipping point.

CAUSTIC SODA—Some improvement noted in shipments, market still tight. Solid caustic soda is reported at $2.85 per 100 pounds; flaked and ground offered at $2.25 to $3.25 per 100 pounds, car lots, at works.

CHINA CLAY—Demand steady, domestic grades in good supply. Domestic filler clay is currently $9 to $11 per ton, car lots. Coating clay is currently $15 to $30 car lots. Imported clay is currently quoted at from $18 to $35 per ton, in car lots, export warehouse.

CHLORINE—Market tight as demand continues strong. Lack of tank cars continues to hamper deliveries. Quantities unchanged. Chlorine is currently quoted at $2.25 to $3.75 per 100 pounds.

ROSIN — Gum rosin in drums per 100 pounds, net, in yard New York, car lots, B. D. $8.25; E, $8.30; F, $8.48; G, $8.51; H, $8.60; I, $8:76; K,M,N,WG, $8.77; WW, $9.03. Wood rosin, per 100 pounds net, f.o.b., l.c.l. N. Y. $6.45; FF, $7.95; G, H, I, K, M, $8.52; N, $8.57; WG, $8.62; WW, $8.87; X, $8.97.

SALT CAKE — Demand continues strong with slight improvement in shipments. Prices remain unchanged. Domestic salt cake is quoted at $20 to $26.

SODA ASH—Demand active with no improvement in supply situation, previous orders filled. Contract orders prevail at the same high levels. Current prices, car lots, per 100 pounds, are as follows: in bulk, $1.10; in paper bags, $1.30; and in barrels, $1.70.

STARCH—Capacity production absorbed by active demand, export demand eased up. Starch prices continue strong with the pearl grade quoted at $6.52 per 100 pounds; powdered starch at $6.63 per 100 pounds, car lots, Chicago.

SULPHATE OF ALUMINA — Active demand covered by fair supplies. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.30 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is quoted at $1.95 to $2.25 per 100 pounds in bags at works.

SULPHUR — Supplies ample to meet increasing demand. Annual contracts are quoted at $18 per long ton, f.o.b. mines; the price f.o.b. at Gulf Ports is $19.50 per long ton.

TALC—Domestic demand shows increasing strength with French grades steady. Domestic grades are currently quoted at from $16 to $30 per ton in mines; Canadian at $35 to $45 per ton. All prices in car lots.

DIGESTED

Some publishers, in a mad scramble to increase circulation and advertising revenue have engaged in the sporadic purchase of spot newsprint. The purchase of spot newsprint at fantastic prices is not conducive to the stabilization of newsprint price levels. To continue this would be rendering a disservice to our industry and to our regular suppliers.—E. B. STAHLMAN, JR., *President, Southern Newspaper Publishers Association.*

The rise in replacement costs has created a situation which needs to be recognized and dealt with by the large majority of industrial concerns. The impact of the problem varies widely in individual cases, and the most appropriate means of dealing with it probably differ accordingly. Some companies expanded their facilities rapidly during the war and face no immediate replacement problem, while others were prevented from fully maintaining their equipment and are now obliged to make replacements on an abnormally large scale. Some enterprises and some industries are growing more rapidly than others and must make provision for large additions as well as replacements.—Guaranty Trust Company of New York.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1947		Corresponding Weeks—1946	
August 16	104.8	August 17	104.5
August 23	103.7	August 24	106.1
August 30	104.1	August 31	105.6
September 6	84.7	September 7	86.7
September 13 (Revised)	106.9	September 14	105.1
September 20	*180.0*	September 21	105.8

COMPARATIVE MONTHLY SUMMARIES

1946							
Jan.	94.7	June	104.6	Dec.	97.0	Mar.	106.1
Feb.	98.4	July	94.0	Year Avg.	101.1	Apr.	105.1
Mar.	104.4	Aug.	104.7			May	106.2
Apr.	102.7	Sep.	101.3	1947		June	106.0
May	100.7	Oct.	106.4	Jan.	102.1	July	93.5
		Nov.	105.5	Feb.	105.9	Aug.	*104.2*

COMPARATIVE YEARLY SUMMARIES

	1940	1941	1942	1943	1944	1945	1946	1947
Year to Date	86.2	95.0	92.2	88.1	87.8	88.8	100.0	*103.4*
Year Average	85.6	97.4	90.4	87.8	88.1	89.4	101.1	

PAPERBOARD OPERATING RATIOS†

Current Weeks—1947		Corresponding Weeks—1946	
August 16	100	August 17	98
August 23	100	August 24	100
August 30	99	August 31	100
September 6	79	September 7	83
September 13	103	September 14	101
September 20	*101*	September 21	100

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1946	90	91	100	99	94	97	89	99	96	100	99	92	96
1947	99	103	101	100	101	101	90	*99*					

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

EDITORIAL

Paper Marketing

Two authorities, each eminent in his field, and both having a common interest in the smooth flow of printing paper from the mill to its ultimate service in the hands of the user, recently joined forces to urge that the sellers of paper get ready now, and start to build for their future by their policies and their intelligent use of facilities that are provided in their daily contacts with buyers of paper. The two men were A. Ellis Frampton, assistant general sales manager for the Hammermill Paper Company, and Ernest Schmatolla, executive of the Publishers Printing Company, New York printer to publishers, and widely known as lecturer and cost authority. They were speaking at the introductory session of a privately sponsored course in paper marketing, organized for its staff by Reinhold-Gould, Inc., New York paper distributor.

Pointing out that "shortages still persist and are likely to persist for some time to come," Mr. Frampton underscored the need for meeting current market conditions "day by day." "That means," he went on, "continuing to sell via quotas and making utmost capital of available supplies."

Mr. Frampton wouldn't hazard a prophesy of "increased supplies" for the paper consuming industries.

Both Mr. Frampton and Mr. Schmatolla urged a complete turnabout in paper marketing. They called for "better informed sales people" for sales, order department and service department personnel with a "working knowledge of the industries they represent and work with." Mr. Frampton outlined the policies of his company as they related to Hammermill franchise holders and insisted that "good selling procedures" demanded a thorough knowledge of these policies. Continuing, Mr. Frampton said that his company's "merchant-relations program" and "continuing advertising and sales promotion efforts" were projected for the benefit of "everyone participating in the sale of Hammermill products and should be capitalized upon to the fullest."

Mr. Schmatolla highlighted the problems of the paper buyer in today's emergency market. Outlining a day's procurement activities, he asked for a more cooperative attitude among paper salesmen and their houses. The printer's purchasing duties are "one hundred times more troublesome today than they have ever been," he declared. Mr. Schmatolla also urged preparations for a change of selling tactics when shortages "no longer plague the printers." Then the best informed paper salesmen, the salesmen who talk the language of the printer, who understand the printers' business, his special paper needs, will reap the harvest." Educational programs "like this" will help develop the "kind of salesmen printers like to do business with," Mr. Schmatolla concluded.

Printing Week

To its permanent agenda for advancing the interests and serving the welfare of the distributing branch of the paper industry's widespread activities the National Paper Trade Association has undertaken another wholly promotional and cooperative activity. Through its membership it has asked that everyone whose career is identified with paper take a heightened interest in a movement that has been launched by the International Association of Printing House Craftsmen to set aside the week of January 11-17 as Printing Week. The final day of this period, it is pointed out, is the anniversary of Ben Franklin's birth. At its annual convention last Spring the Paper Trade group listened to an outline of plans for the week as presented by Russell Hogan, New York printer and vice-president of the Craftsmen group. He urged at that time, and the N.P.T.A. has endorsed the plan, that a general program be adopted.

All interested associations were urged to adopt resolutions sponsoring the idea of Printing Week and pledging their support.

Mills advertising in magazines and trade papers were asked to instruct their advertising executives and agencies to slant their January ads toward a recognition of Printing Week and the importance of the Graphic Arts.

Association members were told to use the Printing Week medallion now in preparation as an integral part of their publicity and promotional material, together with appropriate stickers on correspondence, invoices and statements during the month of January and wherever else it could tie in with this promotion.

Publishers of house organs were invited to give editorial comment to this subject in their November and December issues and make a special feature of Printing Week in their issues for the month of January.

Boldness With Prudence

The news on another page of this issue that International Paper has voted to add $25 million more to the $22 million already in process of use in developing its existing facilities without adding costly new structures serves at once as a heartening stimulant and a model of conservatism. In that the big company is planning, by the end of 1949 to increase its capacity for Kraft by a thousand tons a day the step bears every mark of confidence in the future, the kind of action that breeds further confidence. In that this is to be done through improvement of present equipment, and not in the form of more new mills, the action can be regarded as matching confidence with prudence.

EDITOR

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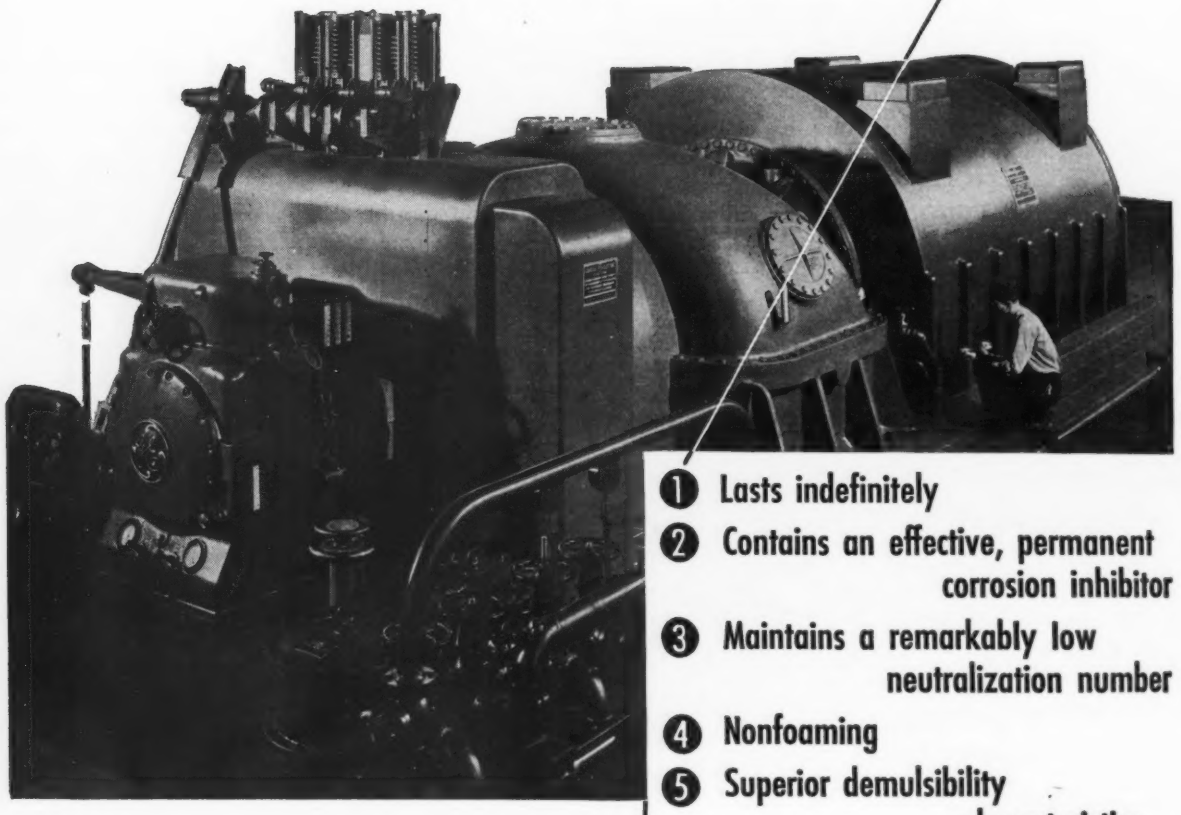

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Factors Affecting Measurement of Water Vapor Permeability at Low Temperatures*

By W. H. Aiken[1]

Abstract

A method is described for rapidly measuring water vapor transmission of nonsorbing barriers at low temperatures...Factors affecting the measurement of water vapor transmission rate at low temperatures are discussed. These include: reduction of vapor pressure at reduced temperatures; effect of temperature on inherent transmission characteristics of barriers; and water absorbing characteristics of barrier and how they are affected by temperature.

Protective packaging materials may be divided into three classes as follows:

1. Homogeneous films of low water absorption. This class includes such films as Pliofilm, polyethylene, polystyrene, and saran.
2. Homogeneous films of medium to high water absorption. This class includes such films as the cellulose esters and ethers, and uncoated cellophane.
3. Composite barriers in which a carrier or base of medium to high water absorption is coated or laminated with a water vapor resistant coating. Coated and laminated papers and cellophane are typical of this class.

In choosing a method for determining water vapor transmission at low temperatures, the factors which affect the water vapor transfer rate of each of these classes of material at both normal and low temperatures must be carefully considered.

Homogenous Films of Low Water Absorption

The laws that govern the passage of water vapor through homogeneous, hydrophobic plastic films are fairly well established as these materials appear to obey Fick's law for diffusion of gases through solids. For these films, then, the amount of water passing through a film is directly proportional to the water vapor pressure across the film and inversely proportional to the thickness of the film *(1)*. Varying the relative humidity in contact with the film affects the transmission of the film only as it affects the vapor pressure difference across the film. Rouse *(2)* has recently shown that the relative humidity with which a layer of such a film is in equilibrium varies uniformly across the film. That is, if one side of the film is in equilibrium with 100% relative humidity and the other side is in equilibrium with 0% relative humidity, the center of the film will be in equilibrium with 50% relative humidity. A plot for Rouse's data on polyethylene is shown in Fig. *(1)*.

It has been shown *(3)* that for a number of plastic films, the rate of water vapor transfer decreases with decreasing temperatures according to the equation:

$$P \equiv P_o e^{-E/RT}$$

Where P = rate of water vapor transfer rate of some given temperature,
P_o = water vapor transfer rate at infinite temperatures,
e = 2.718, the natural logarithm base,
E = energy of activation for permeation,
R = the gas content, and
T = absolute temperature.

Since this relationship holds, a plot of the log of water vapor transfer rate against the reciprocal of absolute temperature gives a straight line. The vapor pressure of water at any given relative humidity is of course also greatly reduced with reduced temperature and the plot of the log of water vapor pressure against the reciprocal of absolute temperature also gives an approximate straight line. Therefore, when the effect of temperature on the transmission characteristics are combined with the effect of temperatures on vapor pressure, straight line plots are obtained on a log transmission vs $1/T$ plot. From such curves it is possible to predict the water vapor transfer rate of a film at any given temperature.

Therefore, for homogeneous, nonsorbing film it is necessary to make measurements only at two or three temperatures, say 100, 50, and 0° F., to estimate the water vapor transfer rate at any given temperature. The apparatus suggested by Barrer *(4)* and first used in this country on the Quartermaster Project at Brooklyn Polytechnic Institute *(1)* during the war is ideally suited for such measurements. This apparatus consists essentially of a divided cell in which the test specimen is mounted and both sides of the cell are evacuated. Water vapor at some given relative humidity is introduced on one side of the film and the water vapor transmitted is measured by the increase in pressure on the other side. The method suggested by Rouse *(2)* for measuring pressure appears to be simple and efficient. Frequent measurements are made and the data plotted as

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 24-27, 1947.

[1] Member TAPPI; Asst. Manager, Plastics & Coating Dept., Goodyear Tire & Rubber Co., Akron, Ohio.

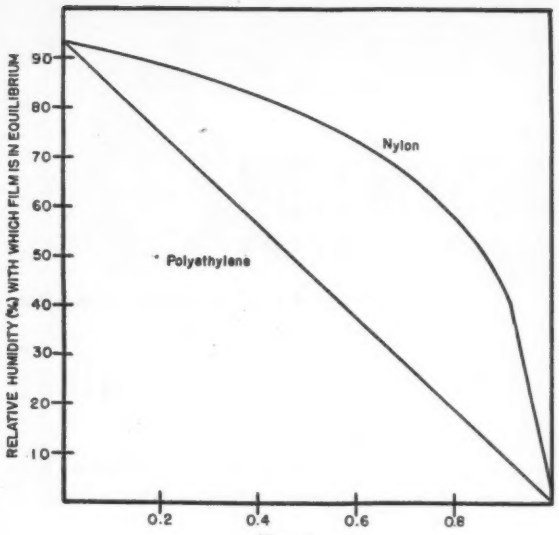

FIG. 1

pressure increase against time. The rate of pressure increase is obtained from the curve after steady flow has been established. Since the volume of the apparatus is known, the amount of water vapor transmitted through the film can be calculated from the pressure increase. At 100° F. the total test time may be only an hour, and the rise in vapor pressure on the dry side is not sufficient to reduce the driving head across the film. At 0° F. measurable quantities of vapor may be transmitted by the end of an hour and a complete curve obtained in 1 to 2 days.

The advantages of this method are obviously its speed, its flexibility in varying test conditions, and the fact that it is small enough to be easily jacketed for temperature control.

Homogeneous Films of Medium to High Water Absorption

These materials as such are of little interest as water vapor barriers. They are of interest, however, as bases for coating and lamination. Some of the factors affecting the transfer of water vapor through these films are becoming more clearly understood. A predominant factor influencing water vapor transfer of these films is the relative humidity in contact with the two sides of the film. It appears that many films of this class are rather resistant to the passage of water vapor if the relative humidity is kept low on both sides (say 40% or 50% R.H. on the wet side) but as higher relative humidities are brought in contact with one or both sides of the film, the water vapor transfer rate rises rapidly. Apparently the increased amount of water absorbed at high relative humidities acts as a plasticizer to increase the rate of diffusion of water vapor. Charch and Scroggie *(5)* found the water vapor transfer rate of uncoated cellophane to be very dependent on relative humidity. When the relative humidity was held constant and the temperature varied (over a range from 31.5° C. to 43° C.) the water vapor transfer rate was directly proportional to the vapor pressure difference across the film, but when the temperature was held constant and the relative humidity varied, the water vapor transfer rate was not directly proportioned to the vapor pressure difference. Their data on uncoated cellophane at 103° F. show that when a relative humidity of about 2% was maintained on one side of the film, the water vapor transfer rate per unit vapor pressure increased over five-fold when the relative humidity on the other side was increased from 31.5% to 75% R.H. Deeg and Frosch *(6)* found that if one side of a polyamide film were exposed to 100% R.H. at 25° C. that increasing the relative humidity on the dry side of the film from 1 to 88% increased the water vapor transmission rate per unit of vapor pressure difference over nine-fold.

It has long been supposed that in any type of material that the relative humidity with which a layer of the film is in equilibrium varies uniformly across the film, and that the water absorbed by the test film would be the same as that which would be absorbed if the film were in equilibrium with the average of the relative humidities on the two sides of the film. However, in 1936, Abram and Brabender *(7)* noted that for uncoated glassine, the water absorbed by the paper appeared to be more nearly in equilibrium with the relative humidity on the wet side of the sheet than with the average of the relative humidities on the two sides. Recently Rouse *(2)* has shown that the greater portion of a nylon sheet is in equilibrium with a much higher relative humidity than the aver-

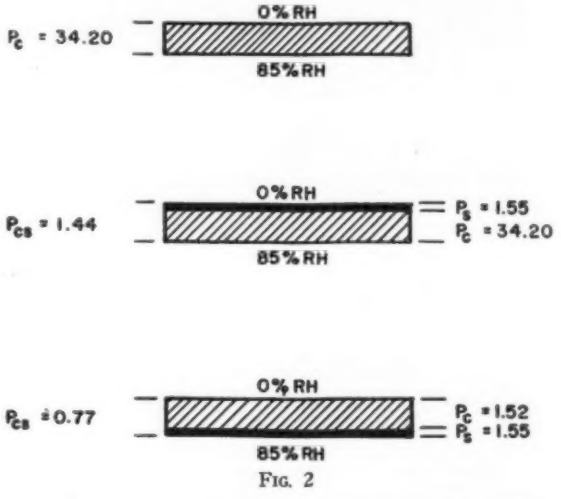

FIG. 2

age of the relative humidity on the two sides of the sheet. Figure 1 from Rouse's data shows how the equilibrium relative humidity varies across a nylon sheet with 93% relative humidity on one side and 0% on the other. The water content of the sheet is about the same as would be absorbed by the sheet if it were conditioned in an atmosphere of 75% relative humidity.

Composite Barriers

This class of materials is used for the majority of protective packaging applications, yet very little is known of the factors affecting its water vapor transfer rate.

The effect of thickness of the coating or laminant on the water vapor transfer rate of composite barriers is not too well known. It appears that for coatings of such materials as nitrocellulose (containing no wax) *(8)* and oil *(9)* that there is a linear relation between resistance to passage of water vapor and thickness of coating. It appears logical that such a relationship holds for sheets coated or laminated with wax. There is, however, little known about

the effect of coating thickness of such materials as cyclized rubber, nitrocellulose, polyamides, and ethyl cellulose which depend upon a small wax content for their resistance.

The water vapor transfer rate of composite barrier containing an absorbing base or carrier such as paper or cellophane is influenced by the properties of the absorbing base. The water vapor transfer rate is therefore related to the relative humidity in contact with the two sides of the barrier.

There is a considerable amount of evidence to indicate the base sheet contributes a substantial portion of the resistance of the composite barrier. Wing *(8)* coated cellophane on one side with a nitrocellulose lacquer and tested the sheets with the uncoated side exposed to the dry atmosphere. Plots of his results show a linear relationship between coating thickness and resistance to water vapor passage. If, however, the coating thickness is exterpolated to zero, a resistance to water vapor passage is still indicated, and this is likely due to resistance of the dry cellophane sheet itself. Similar results were obtained by Comar and Miller *(9)* on oil coatings applied to one side of bond paper and tested with the uncoated side exposed to the dry atmosphere.

Cellophane coated on one side with saran was subjected to 85% RH on one side and 0% RH on the other at 25° C. When the uncoated side was subjected to the wet atmosphere the sheet had a water vapor transfer rate of 1.48 g./100 sq. in./24 hours but when the uncoated side was subjected to the dry atmosphere the sheet had a water vapor transfer rate of 0.77 g./100 sq. in./24 hours. An uncoated sheet of the same cellophane gave a water vapor transfer rate of 34.20 g./100 sq. in./24 hours when subjected to the same conditions. Knowing these values it is possible to calculate the water vapor transfer rate of dry cellophane by use of the equation:

$$1/P_s + 1/P_c = 1/P_{cs}$$

Where P_s = water vapor transfer rate of coating,
P_c = water vapor transfer rate of cellophane, and
P_{cs} = water vapor transfer rate of coated sheet.

When this is done a value of 1.55 g./100 sq. in./24 hours is obtained for the resistance of the coating and a value of 1.52 g./100 sq. in./24 hours is obtained for the resistance of the dry cellophane. These results are shown graphically in Fig. 2.

The fact that coated papers and cellophanes have higher rates of water vapor transfer per unit vapor pressure when in contact with high relative humidities than when in contact with low relative humidities is, of course, well known. The increased rate of transfer per unit vapor pressure is especially great at relative humidities of greater than 90%. In view of Rouse's finding that a hydrophilic material may have a water content much greater than it would have if in equilibrium with the average of the relative humidities on the two sides of the sheet, examination of the water absorption curve for cellulose at various relative humidities gives a possible explanation for this greater transfer rate at higher relative humidities. Typical absorption curves for cellulose plotted from data of Weigerink *(10)* are shown in Fig. 3. For a sheet with 90% R.H. on one side and 0% on the other, there would be only a moderate increase in the water content of the sheet when the relative humidity on the wet side of the sheet was increased to 100% R.H. if the water content in the sheet were in equilibrium with the average of the relative humidity on the two sides of the sheet, for the absorption curve in the 45 to 50% relative humidity range is relatively flat. If, however, the water content of the sheet is more influenced by the relative humidity on the wet side than on the dry side (as indicated by the finding of Rouse) then the water content of the sheet might increase appreciably when the relative humidity on the wet side is increased from 90 to 100% relative humidity, for the cellulose absorption curve is much steeper at relative humidities above 60%.

There are a number of factors that may affect the water vapor transfer rate of composite barriers at low temperatures.

(a.) Effect of temperature on vapor pressure. Reduction in temperatures give rapid reductions in vapor pressure, thereby reducing the driving force across the film. For 100% relative humidity the water vapor pressure at 100° F. is 49.104; at 0° F. it is 0.958; and at —20° F. it is 0.321. Therefore, if the water vapor transfer rate of a composite barrier is proportional to vapor pressure difference at constant relative humidity, (as Charch and Scroggie found for uncoated cellophane for a limited temperature range) the water vapor transfer rate at 0° F. would be only about 1/51 of the rate of 100° F., and at —20° F. only 1/153 as great as at 100° F.

(b.) Effect of temperatures of water vapor transmitting characteristics of coating. The effect of temperature on the water vapor transmitting characteris-

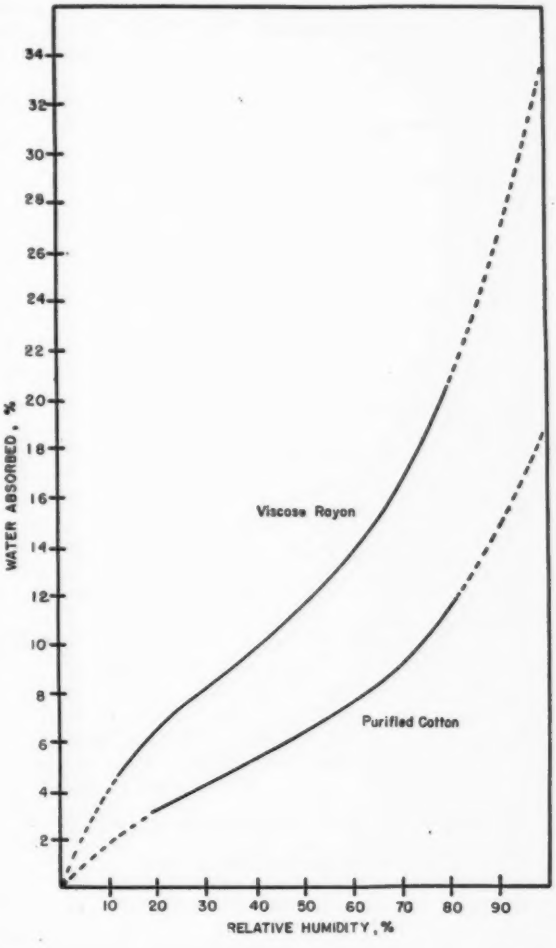

FIG. 3

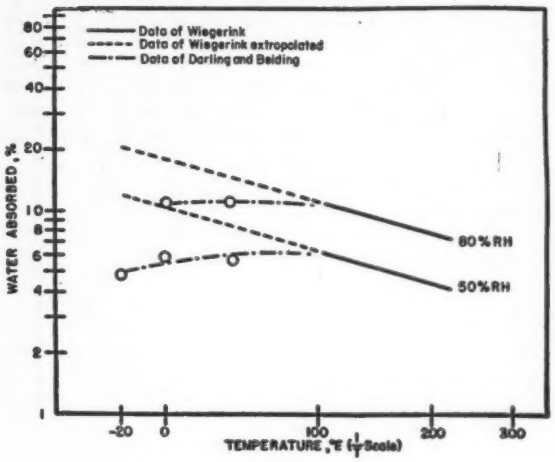

FIG. 4

tics of composite barriers has not been determined.

(c.) Effect of temperature on water absorbing characteristics of base sheet. At normal temperatures the amount of water absorbed by the base sheet is important not only because of the way it affects the water vapor transfer rate, but also because it affects the time required for the sheet to obtain equilibrium and therefore for the transfer rate to become constant. At low temperatures the latter factor becomes of major importance, because the lower transfer rate of the coating greatly increases the time required for the film to come to equilibrium.

Wiegerink *(10)* found that between 275 and 100° F. the water absorption of cellulose increases with decreasing temperature. Between 212 and 100° F. a plot of the logarithm of water absorption against the reciprocal of absolute temperature gives a straight line as shown in Fig. 4. If this same relationship holds at lower temperatures, then the amount of water absorbed by cellulose at 0° F. may be as much as 75% greater than that absorbed at 100° F. Less complete data of Darling and Belding *(11)* however, indicates that this relationship may not hold below 100° F. Their data, also shown in Fig. 4, indicate that at lower temperatures the amount of water absorbed may be less than that absorbed at 100° F.

Many base sheets are plasticized with glycerine and other hygroscopic materials. There is no information on cellulose - glycerine - water systems at low temperatures. It has been shown *(12)* that the glycerine-water system follows Duhring's rule and, therefore, the relative humidity given by various water-glycerine mixtures at various temperatures can be calculated. Figure 5 shows such values calculated from Duhring constants of Carr, Townsend, and Badger *(12)* and from vapor pressure data of Grover and Nicol *(13)*. These curves indicate that the relative humidity in equilibrium with a given glycerine-water mixture is independent of temperatures, at least down to the freezing point of the mixture. The freezing point data shown are those of Bosart and Snoddy *(14)*.

(d.) Conditioning and testing of composite barriers at low temperatures. As pointed out above the known facts about the water absorbing and transmitting characteristics of composite barriers at normal and low temperature are rather meager, but they all indicate that the testing period at low temperatures must necessarily be long. As an example, con-

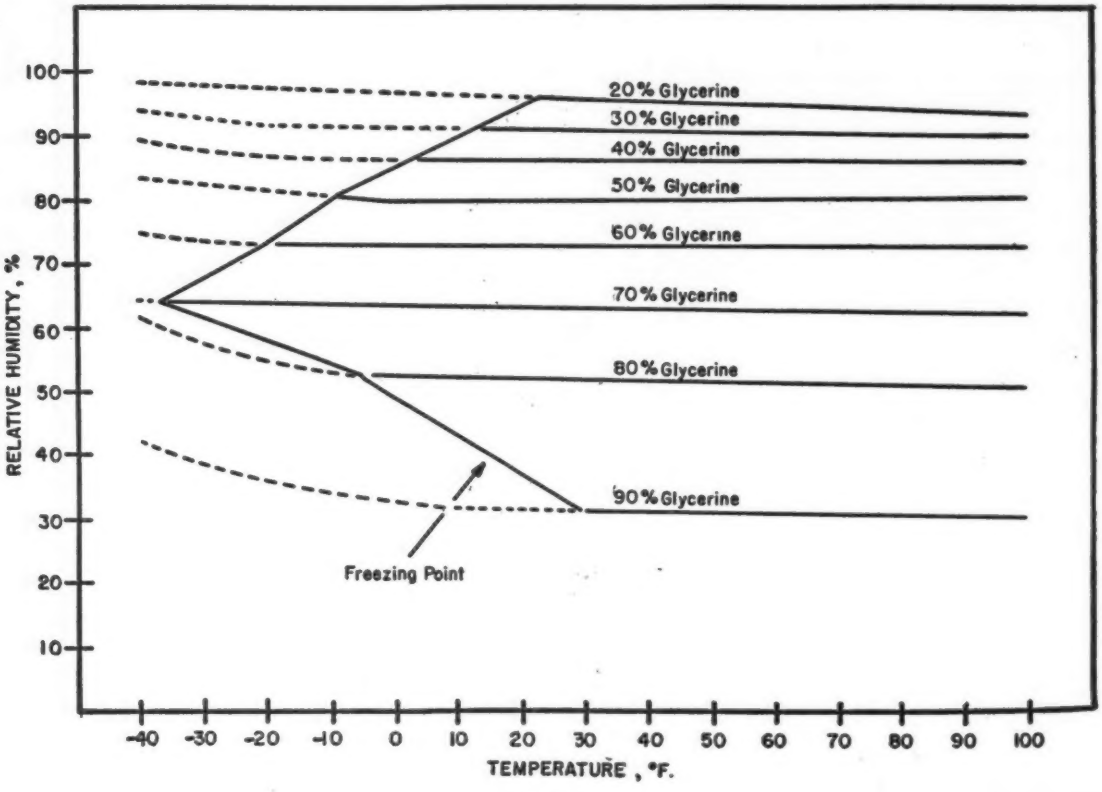

FIG. 5

sider a 20-pound glassine sheet coated with a material that will give it a water vapor transfer rate of 0.25 g. per 100 sq. in. per 24 hours at 100° F. with 92% R.H. on one side and 0% on the other. After the film had reached equilibrium, a test sample of 20.4 square inches, as used in the General Foods test, would transmit 0.05 grams of water vapor in 24 hours. If the temperature were reduced to 0° F. the reduction in vapor pressure alone would indicate that the test area would transmit 0.0010 grams of water vapor per 24 hours; if the temperature were reduced to —20° F., the reduction in vapor pressure alone would indicate that the test area would transmit 0.0003 grams of water vapor per 24 hours.

If the amount of water absorbed by a sheet at low temperatures with a given high relative humidity on one side and a given low relative humidity on the other side were known, then the sheet could be preconditioned at normal temperatures to give it this water content. There are, however, no data on the amount of water absorbed by a coated sheet at room temperatures under test conditions, and the data on the effect of temperature on water absorption of cellulose are not conclusive. Perhaps the best procedure to follow would be to precondition the sample at room temperature with relative humidity condition on the two sides which are the same that will be used at low temperature. Even if this procedure is followed, it would be fortunate if the water content of the preconditioned sheet varied less than 20% from the water content of the sheet in equilibrium with the test condition at low temperature. Figure 3 shows that the water content of purified cellulose in equilibrium with 75% relative humidity is about 10%, so the water content of the test sheet could easily be off by 2% of the weight of the sheet. A 20.4 square inch area of a 20-pound sheet weighs 0.428 grams, so the water content could easily be off 0.008 grams from the equilibrium value at low temperatures. If the sheet is coated equally on both sides, and assuming that each side of coating offers half the resistance to water vapor passage, it would require 4 days at 0° F. and 13 days at —20° F. for the test sheet to come to equilibrium.

This time to come to equilibrium would be much greater if the absorption of water by cellulose is appreciably changed at low temperatures. Because of this long conditioning period necessary it is not practical to test composite barrier at low temperatures by the method described above for homogeneous films of low water absorption.

The very low transfer rates after equilibrium has been obtained makes very long test periods necessary if a gravimetric method is used. It appears that a method should be chosen that allows a large number of samples to be run at once, so that ample time can be allowed for conditioning, and which can then measure accurately the small amounts of water vapor that are transmitted by the film after it has reached equilibrium.

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Second Fall Meeting of TAPPI Devoted To Plastics

The TAPPI Plastics Committee with about one hundred interested persons from the paper and allied industries held the second of the fall meetings sponsored by the Technical Association of the Pulp and Paper Industry at Syracuse, New York, September 25 and 26, 1947. The discussion sessions were held at the New York State College of Forestry with a dinner meeting Thursday night at the Hotel Syracuse. E. C. Jahn, Chairman of the Plastics Committee and professor at the College of Forestry, was the general chairman.

The program was opened by W. F. Gillespie, President of the Technical Association and by Dean Illick, Dean of the College of Forestry. Dean Illick in welcoming those in attendance outlined the development in forestry education in the fifty years since the foundation of the first college and indicated that wood products, which include plastics, are becoming increasingly important to such institutions with funds being specifically allocated for research purposes.

New Resins

R. A. Barkhuff, Monsanto Chemical Co., Chairman of the Resins and Plastics Subcommittee after explaining the objects of his group which is interested in the production of resins and plastic materials, introduced G. H. Tomlinson of the Howard Smith Paper Mills, Ltd. Mr. Tomlinson described the process by which a plastic material is made from the lignin of deciduous trees pulped by an alkaline process. The species of tree pulped is an important factor in regard to the melting point of the final product, and the process and its control are important to particle size. The lignin is added to the beater in such proportion that the sheet is 40% lignin and 60% fiber. Glue is added to aid retention and about 15% of a water soluble phenolic resin is applied at the size press to act as a plasticizer. The sheets are laminated at 150 to 155°C at 750 to 800 p.s.i. R. J. Seidl of the U. S. Forest Products Laboratory in describing their work on lignin indicated that the addition of alum caused a decrease in strength but increased the water resistance of the laminate. Temperature affects density and strength but not necessarily the molding properties. A lignin-filled sheet dried at high temperature has interesting possibilities as a corrugating medium.

The use of polyester resins was described by D. G. Patterson of the American Cyanamid Co. Several

types of this material are available for impregnating and spray applications. It is possible to laminate at pressures varying from contact to 250 p.s.i. which property makes it important to continuous laminating processes.

E. K. Stilbert, Dow Chemical Co., reported on a new synthetic latices which when added to casein, starch, or soya protein produces a tougher, more water resistant coating. It is a tacky film former and acts as a permanent plasticizer.

The preparation of vinyl resin fibers for papermaking was described by H. E. Shearer of the American Viscose Corporation. Introductory experimentation indicates that a cutting treatment may be developed which will not involve the use of a beater. However, the most satisfactory results have been obtained by beating in standard equipment in admixture with about 20% sulphite pulp.

A wetting agent and a defoamer are necessary for the wetting of the fibers and subsequent formation of a sheet. The bond is affected by hot calendering and the resulting product has wet strength and heat seal properties.

Resin Analysis

The Thursday afternoon session was devoted to a discussion of the methods for resin analysis and to the requirements of the paper industry for special test methods. T. A. Howells of the Institute of Paper Chemistry acted as chairman and was assisted by L. V. Larsen, General Electric Co., A .L. M. Bixler, Riegel Paper Co., Harry Kline, Reichhold Chemicals, Inc., N. R. York, St. Regis Paper Co., C. S. Maxwell, American Cyanamid Co., and J. C. Parsell of the J. P. Lewis Co. Resin and volatile contents of the resin solutions and the final product appeared to be most interesting and considerable time was devoted in discussing possible test methods. The flow test is more indicative of properties required of a resin for processing with the volatile and resin content of interest in the purchase of the resin and in specifications on the final product. The existence of several varied methods of tests complicate the problems of the paper converter who acts as a purchaser and as a supplier.

Following the dinner which was held in a ballroom of the Hotel Syracuse, Thursday night, S. S. Gutkin, Falk & Co., with the assistance of George Borden, Riegel Paper Co., who was coauthor, presented a very comprehensive resume of the monograph "Resins for the Paper Converter" which he and Mr. Borden prepared for the TAPPI Coating Committee. The monograph is now at the press and it is expected that it will be issued shortly. This was followed by a summation of the development of wet strength papers by K. W. Britt, Scott Paper Co., Chairman of the TAPPI Wet Strength Committee. He divided the development into three periods: 1938 to 1942, in which aqueous solutions of low polymer urea formaldehyde resins were used on the surface of the sheet, 1943 to 1946 saw the beater addition of high polymers, and the beginning of the present period which is characterized by the use of specific resins for specific purposes. The importance of wet strength papers is evidenced by the increasing number of literature references. C. J. West listed 177 in a recent compilation and the fact that tonnage has reached an approximate figure of 360,000 tons annually, for such items as tea bags, sacks, towels, drapes, car liners, and structural papers.

Fabrication and Conversion

The meeting Friday morning was under the chairmanship of R. H. Mosher, Marvellum Co., and chairman of the Fabrication and Conversion Subcommittee. He announced the division of this subcommittee into two committees, one of which is to be devoted to the manufacture of structural products and the other to the application of plastic materials as coatings, laminants, and saturants for protective and decorative functions.

The effects on dimensional stability caused by immersion of paper laminates in water was discussed by C. J. Straka, Westinghouse Electric & Mfg. Co. The need for a standardized test was emphasized as well as more comprehensive studies of the effect of such factors as the paper furnish, sheet thickness, absorbency, temperature of resin application, and resin cure on dimensional stability.

During the session pulp molding and punch stock, were discussed briefly. The subject of "wildness" was considered and although an electrical scanner has been used in the evaluation of formation with varied success, it was believed that additional investigation is warranted.

Friday afternoon was devoted primarily to a discussion of committee activities with attention given to those problems which were accented in the discussion of the previous sessions.

The meeting, which was, in effect, an open meeting of the Plastics Committee, was attended by:

Aid, Joseph J.
Apelgren, Carl
Arnold, Kenneth A.
Bainbridge, Jr., J. P.
Barkhuff, Jr., R. A.
Bergendahl, Carl
Bingham, Richard T.
Bixler, A. L. M.
Boyle, Francis R.
Britt, K. W.
Brown, G. Basil
Case, John C.
Cornell, John
DeCew, J. A.
Denham, Fred H.
Doughty, R. H.
Dowst, S. K.
Dreis, A. G.
Dreshfield, Arthur C.
Ekholm, K. Ivar
Eppel, Norman S.
Ferguson, J. W.
Fladmark, E.
Fries, K. W.
Gillespie, W. F.
Goodloe, Paul M.
Gould, R. F.
Govaerts, Pierre
Guastella, Samuel L.
Gutkin, S. S.
Hescock, M. A.
Heuer, John H.
Hurd, Howard W.
Hewett, P. S.
Hollabaugh, C. B.
Holstein, Jr., Alex.
Howells, T. A.
Hurst, R. H.
Jahn, E. C.
Kaufmann, Dr. Werner
Keim, Gerald
Kelley, Louis E.
Kelley, Dr. Maurice J.
Kline, Harry
Kenan, Ralph H.
King, Albert D.
Koon, A. W.
Kraske, Wm. H.
Lancaster, T. A.
Larsen, L. V.
Lemke, Warren A.
Lieb, David J.
Lohnas, John D.
Long, F. D.
Lorand, George E.
Luey, A. T.
Macdonald, R. G.
Macdonald, W. N.
Malamphy, Richard H.
Malloch, R. C.
Maxwell, Charles S.
McCarthy, W. T.
Moore, John D.
Mosher, Robert H.
Neumann, P. F.
Nielsen, Tor
O'Brien, A. S.
Parsell, J. C.
Patterson, D. C.
Pattilloch, D. K.
Pollet, Dalton L.
Prince, Ralph N.
Ramage, Fred R.
Rastatter, E. L.
Rhodes, C. M.
Robertson, J. H.
Ronning, O. K.
Schattner, Walter C.
Schreiber, Milton D.
Seale, J. M. A.
Seidl, Robert J.
Selmser, R. W.
Semmens, G. S. C.
Shearer, Howard E.
Soderlund, Ulf
Spencer, H. A.
Stilbert, E. K.
Storin, Gordon K.
Straka, C. J.
Tobias, L. S.
Tomlinson II, G. H.
Upright, Richard M.
Upson, Charles A.
Vaughan, M. H.
Wakefield, H. F.
Wanstall, W. E.
Whitman, Frank A.
Yorke, N. R.
Youngchild, K. E.
Zimmerli, Wm. H.

Experiments on the Production of Insulating Board and Hardboard from Western Sawmill and Logging Waste*

By S. L. Schwartz[1], J. C. Pew[1] and E. R. Schafer[1]

Abstract

Insulating-board and hardboard experiments were made on eight types of western sawmill, veneer-mill, and logging wastes. Western hemlock slab-and-edging waste was subjected to six softening treatments, including water, steam, sodium sulphite, caustic soda, and lime. Because of quality of product, considered in relation to simplicity of treatment, a steaming treatment of ½ hour to 180° C. and ¼ hour at 180° C. was used for the other wastes.

Acceptable insulating boards and hardboards were obtained from Western hemlock slabs and edgings, and from veneer wastes and white fir logging waste. Less promising results were obtained from the Western hemlock planer ends, apparently because of the bruised condition of the hogged material. Boards produced from the Douglas fir wastes were of marginal or submarginal quality, especially those made from the hogged planer ends. The Douglas fir planer shavings, a finely divided type, when used alone, were wholly unsuited for the purpose. It is possible that better results might be obtained from the Douglas fir wastes by use of other cooking and manufacturing methods.

This report describes experiments on sawmill and logging wastes from western woods for the production of insulating boards and hardboards. The work included a limited investigation of several procedures for the preparation of the coarse-fibered pulps, and the determination of the suitability of several species and forms of waste for these products.

Eight samples of sawmill and logging wastes and three mixtures of equal parts by weight of some of the wastes, as given in the following list, were tested: 1. Western hemlock slabs and edgings; 2. Western hemlock hogged planer ends; 3. Western hemlock hogged veneer waste; 4. Douglas fir, old growth, slabs and edgings; 5. Douglas fir, old growth. hogged planer ends; 6. Douglas fir, old growth, hogged veneer waste; 7. Douglas fir, old growth, planer shavings; 8. white fir cordwood (logging waste); 9. mixture of Douglas fir, old growth, slabs and edgings and Western hemlock slabs and edgings; 10. mixture of Douglas fir, old growth, slabs and edgings and Douglas fir, second growth, cordwood (logging waste); and 11. mixture of Douglas fir, old growth, slabs and edgings and white fir cordwood.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 24-27, 1947.

Acknowledgment is made to the Simpson Logging Company, Shelton, Wash., for its cooperation in this work.

[1] Member TAPPI; Engineer, Forest Products Laboratory,[2] Forest Service, U. S. Department of Agriculture.

[2] Maintained at Madison 5, Wisconsin, in cooperation with the University of Wisconsin.

Equipment and Procedures

Cooking and Milling

The wood wastes, either as received or later converted to chip form, were treated, or softened, by soaking in water or by some cooking procedure and then pulped in a 36-inch Bauer mill. One of the wastes, Western hemlock slabs and edgings, was selected for a variety of treatments as follows: 1. soaking in water; 2. steaming at elevated temperatures and pressures; 3. digesting in water at elevated temperatures and pressures; 4. digesting in neutral sodium sulphite solution at elevated temperatures and pressures; 5. digesting in caustic-soda solution at elevated temperatures and pressures, and 6. digesting with lime and water at elevated temperatures and pressures.

Five-eighths-inch chips were prepared from the Western hemlock slabs and edgings. For the experiments involving water-soaked chips, a quantity of the chips was soaked in water at room temperature for 24 hours and then divided into lots of 10 pounds each (moisture-free equivalent) for milling. At first, the chemical, steam, and water-cooking treatments were conducted in a 1.5-cubic-foot stainless-steel-lined rotary digester, and the charge of chips in each case was, on a moisture-free basis, approximately 12.5 pounds. In each type of treatment, several such digestions were made in order to arrive at appropriate cooking and milling conditions. Later, selected procedures were followed by cooking in a 13-cubic-foot digester, using 50 pounds or more (moisture-free basis) of chips and subdividing the cooked chips into portions for milling trials.

In conducting the smaller digestions, yields were determined by sampling the softened chips after they had been soaked overnight in hot water. This procedure gave unreliable results, because, even after the long soaking period, the chips contained considerable soluble matter. Consequently, in making the larger digestions, yields were determined by processing a sample of each run in a 10-pound size beater and determining the resulting amount of washed stock.

The other wastes were digested by a single process only; that is, steaming at an elevated temperature and pressure. A schedule of ½ hour to a maximum temperature of 180° C. and ¼ hour at that temperature was used. The cooks were made in the larger digester, and yields determined by fiberizing a sample of the chips in the beater as explained previously.

Except for the soaking process the treated chips were milled, using B-980 plates run in a counter-clockwise (cutting) direction. In the experiments with soaked wood, it was found preferable to reverse the direction of rotation in order to secure a brushing action. The resulting pulps were collected in a

screen box, and a preliminary Oliver freeness was determined, on the stock in this state. The pulps were then pressed to remove excess water, the dryness determined, and the Oliver freeness checked, using accurately measured samples. The Oliver freeness of a stock suitable for running on existent commercial board machines should be between 40 and 60 seconds. It was found difficult, even with repeated trials, to mill small runs within these limits. Consequently, the mixing of free and slow pulps to obtain a suitable freeness was resorted to in several instances. When this practice was used, the component pulps selected usually had been milled so as to be reasonably close to this desired freeness range.

Insulating Boards

Insulating boards of approximately ½-inch thickness and 17-pounds-per-cubic-foot density were formed in an 18-inch-square improvised suction mold. The charge of pulp was dispersed in water by means of an electric stirrer in a 30-gallon tank fitted with a 2-inch, quick-opening valve. Sufficient water was added to bring the consistency to 1%. The suspension was then neutralized with a small amount of 10% solution of sulphuric acid. This was done to overcome the high alkalinity of the local water supply, which sometimes interferes in the sizing operation. Four per cent rosin size and then 4% papermakers alum were added. The pH of the stock at this stage was approximately 5. At this point the agitation was discontinued and the stock run into the mold. The stock was stirred in the mold; the suction was then applied, and the mat sucked as dry as possible.

The wet mat, approximately 1½ inches thick, was removed, placed between sheet-metal cauls, and pressed in a hydraulic press so that the springback thickness was approximately ⅝ inch. This control was obtained by the use of stops between the press platens. The stops varied from 5/16 inch to ½ inch, depending on the nature of the stock.

The pressed mats were then transferred to a drying frame and dried 14 to 16 hours, or longer if necessary, in a forced-circulation oven at 45 to 65° C. The finished boards were cut into test specimens.

Hardboards

The wet mats of rosin-sized pulp for the approximately ⅛-inch-thick hardboards were formed in an improvised 13-inch-square suction mold. The charge of pulp was sufficient to produce a board of a density of 60 pounds per cubic foot. The forming procedure used was similar to that used in making insulating boards.

These mats, approximately 1½ inches thick, were placed on 16-mesh galvanized-wire screen that was moistened with a lubricant, such as N-butyl stearate or Montan wax. The screen and mat were then placed in a 15-inch-square galvanized-iron tray, covered with a 14-inch-square stainless-steel caul, also coated with a lubricant, and pressed in a 14- by 14-inch, steam-heated, 125-ton-capacity press.

The pressing schedules used entailed three stages: (1) in which the excess water was pressed out and the press platens brought up to temperature; (2) in which the pressure was lowered to allow the mat to expand, thereby insuring uniform drying throughout; and (3) in which sufficient pressure was applied to bring the density of the board up to the desired 60 pounds per cubic foot.

In the first stage, a pressure of 500 to 600 p.s.i. was gradually applied to the mats to squeeze out the excess water. This pressure was maintained for 2 minutes while the steam was on and the platens were heated to 185° C.

The second stage, which lasted for 1½ to 6 minutes depending on the material employed, was initiated by reducing the pressure on the pulp mat to 100 p.s.i. or less. The platen temperature during this stage rose from 185° C. at the start to 190° C., where it was held until the pressing was completed. The reduced pressure was maintained until the pressed mats were nearly dry. This point in the drying schedule could be determined in one of two ways. In most instances the time when no escaping vapor from the pressed mats was visible, was taken as the end point. If satisfactory results were not obtained in the first boards formed, the period was shortened or lengthened as required for subsequent panels. A much more satisfactory indication of the termination of the second stage was obtained by a thermocouple in the mat. The temperatures of the pressed mats were found to reach a constant value slightly above the boiling point of water. This temperature was maintained until the mats were nearly dry. The temperatures of the mats would then rapidly rise to the temperature of the heated platens. The second stage was terminated when the temperature of the mats began to increase rapidly.

The third stage consisted of raising the pressure again to 500 or 600 p.s.i. This higher pressure was maintained until the summation of periods was 10 minutes. In some cases the third stage undoubtedly could have been shortened, thus reducing the total time to less than 10 minutes. Although in the experiments some boards were removed from the press hot and others after cooling, it was evident that cooling of the press was not required.

Methods of Testing

Freeness of Pulps

The "Oliver" freeness, a drainage-rate test, was determined on all pulps as discharged from the mill. As a preliminary freeness test for use as a control of the milling, a batch of stock was added to a 9½-inch-diameter Oliver leaf filter and sucked free of the excess water. A 720-gram portion of this wet material was recharged to the filter and diluted to a volume of 14 quarts. The free water was removed from the dispersed stock under a vacuum of 10 inches, and the time of drainage was recorded in seconds.

The value selected for operational purposes, however, was made with a known weight of pulp. The pulps from the mill were pressed to a dryness of 20 to 30% and the moisture content determined. From these pressed pulps of known dryness, 150-gram samples (moisture-free basis) were charged to the Oliver filter for freeness determinations. In each case a volume of water was added to make up to 14 quarts of stock and the free water removed under 10 inches of vacuum. The time of drainage was recorded in seconds.

Pulp-sheet Tests

Insulating-board pulps can be evaluated to some degree by various tests on pulp sheets. One investigator has found this procedure to be more suitable than most small-scale board tests. In this work pulp sheets of 340-pound ream weight (25 by 40—500) were tested according to TAPPI standards for bursting, tearing, and tensile strengths, and for density. The brightness was measured with the Hunter reflecto-

meter calibrated according to TAPPI method T-217 sm-42.

Insulating-board Tests

Two insulating boards were made of each pulp selected for test. One board furnished three specimens for transverse-breaking load and three specimens for tensile-strength determinations. The other board furnished one water-adsorption and one expansivity-test specimen. The camber, if any, in the various test specimens was removed by conditioning the test pieces in a relative humidity of 97% and redrying under restraint at normal room conditions. The strength-test specimens were then conditioned for at least 24 hours in a relative humidity of 65% and temperature of 75° F. Tests were made according to A.S.T.M. emergency specifications, designation ES-19, August 24, 1942.

Hardboard Tests

Two hardboards were made of each pulp selected for test. One board furnished three specimens for the modulus-of-rupture determination and the other furnished one 12-inch-square water-adsorption sample. Tests were made according to Federal specification LLL-F311, July 12, 1940.

Discussion of Results

Insulating Boards and Hardboards from Western Hemlock Slabwood

The conditions used in the various treating processes and the results of the subsequent milling treatment of Western hemlock slabs and edgings are given in Tables I and II. Only two of the insulating boards met the specification in regard to the corrected transverse-breaking load. These were produced from milled water-cooked chips (test No. 276) and from milled steamed chips (test No. 283). Of all the methods of treat-resultment, however, only the milled water-soaked chips (test No. 256) gave a very low result for this property. Since it cannot be considered that optimum conditions of cooking, milling, sizing, and forming were arrived at in all cases, it is probable that several of the processes, other than steam or water, would be suitable for the production of boards of adequate strength if given more study. Furthermore, it has been noted by others that board made in a laboratory mold usually have poorer

TABLE I.—INSULATING AND HARD-PRESSED FIBERBOARD MADE FROM WESTERN HEMLOCK SLABWOOD

Type of Treatment [1]	Digestion No.	Milling Data [2]		Sheet Test Data [3]				Insulating Board Data [4]							Hard Board Data [5]			
		Bauer Run No.	Energy Consumed,[6] hp. days per ton	Freeness (Oliver), seconds	Bursting Strength, pt. per lb. per ream	Tearing Strength, g. per lb. per ream	Tensile Strength, p.s.i.	Density, g. per cc.	Brightness (Hunter)[7]	Test No.	Thickness, inch	Density, lb. per cu. ft.	Flexure: Breaking Load, lb.	Flexure: Deflection at 12 Pounds, inch	Flexure: Breaking Load (Corrected),[8] lb.	Tensile Strength, p.s.i.	Linear Expansion, %	Water Absorption, %	Test No.	Density, lb. per cu. ft.	Thickness, inch	Modulus of Rupture, p.s.i.	Water Absorption, %
Water soaked	7	176	29	50	0.03 [9]	0.39	59	0.24	32.7	256	0.52	17.1	8.2	0.64	11.4	211	0.40	4.6	267	...	...	...	...
Water cook	11	164	39	67	0.13 [9]	1.08	281	0.24	15.8	255	0.56	15.6	12.3	0.71	11.6	173	0.45	5.7	263	60	0.139	3,460	22.3
Water cook	27	165	24	35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	269	61	...	...	...
Water cook	26	206	33	53	0.16	1.65	415	0.27	13.5	276	0.48	18.6	15.0	0.51	13.6	295	0.60	4.2	285	61	0.136	5,190	15.1
Steam	28	204	29	46	0.14 [9]	1.34	445	0.30	15.2	275	0.49	17.7	12.4	0.84	11.9	261	0.50	4.1	273	60	0.129	5,120	16.1
Steam	23	214	43	83	0.11 [9]	1.04	250	0.25	19.7	283	0.52	16.7	14.2	0.41	13.6	239	0.50	5.6	284	62	0.134	4,220	20.7
	25	215	29	34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Caustic soda	23	190	39	49	0.04	0.52	124	0.26	25.8	274	0.51	17.6	12.7	0.64	11.4	211	0.40	4.6	267	60	0.142	3,310	21.8
Caustic soda	25	200	52	60	0.12	0.90	318	0.29	20.1	254	0.53	16.9	11.5	...	10.4	190	0.40	4.7	269	61	0.138	3,920	20.1
Neutral sulphite	19	186	65	48	0.07	0.87	138	0.22	26.4	254	0.53	16.9	11.8	...	10.9	157	0.45	4.1	265	61	0.131	4,220	19.3
Lime	22	188	45	54	0.05	0.69	144	0.25	19.5	259	0.53	16.7	11.8	...	10.9	157	0.45	4.1	266	61	0.138	4,260	19.3
Commercial boards [10]																							
A										251	0.510	19.2	16.6	0.31	12.5	266	0.10	5.0	272	60	0.140	5,310	11.0
B										277	0.510	22.6	15.7	0.18	9.0	152	0.08	6.0	...	...	...	...	...
C										278	0.509	18.9	15.9	0.34	13.0	238	0.23	8.6	...	...	...	...	...
D										279	0.473	18.8	14.6	0.31	13.3	229	0.20	8.5	...	...	...	...	...
E										280	0.483	17.9	11.1	...	10.7	219	0.15	11.1	...	...	...	...	...
Specification requirements																							
Federal specifications LLL-F321b, Dec. 17, 1942, Fiberboard; Insulating, Class A building board		...								...	0.500 ±0.0625	...	12.0 [11]	0.85 [12]	...	150 [11]	0.5 [12]	7.0 [12]	...	...	...	...	...
A.S.T.M. Emergency specifications, Designation ES-19, Aug. 24, 1942, Class A building board		...								...	...	...	12.0 [11]	0.85 [12]	...	175 [11]	0.5 [12]	7.0 [12]	60 [11]	0.125 ±0.0156	6,000 [11]	20.0 [12]
Federal specification LLL-F311, Fiberboard, Hard-pressed, Structural		...								...	...	...	...	...	...	...	...	...	...	...	...	...	...

[1] See Table II for cooking data.

[2] B-980 plates run in a counter-clockwise direction (cutting) for all tests except Bauer run No. 176 in which they were run in a clockwise (brushing) direction.

[3] Made on sheets weighing approximately 20 grams for 64 square inches (340 pounds ream weight (25 × 40—500).)

[4] Tests made according to A.S.T.M. Emergency specifications, Designation ES-19, Aug. 24, 1942. The boards contained 4% rosin size.

[5] Tests made according to Federal specifications LLL-F311, July 12, 1940. The boards contained 4% rosin size.

[6] Based on moisture-free chips charged and energy input to Bauer mill motors. Figures, though relative, are probably higher than would be obtained in continuous operation.

[7] Calibrated according to TAPPI Method T 217 sm-42.

[8] Corrected to density of 17 pounds per cubic foot (708 pounds per 1,000 square feet) and ¾ inch thickness by the empirical formula, Corrected load = $\frac{\text{measured load} \times 17^3 \times 0.5^2}{(\text{measured density})^2 \times (\text{measured thickness})^2}$

[9] A mixture of equal parts of the pulps from the two Bauer mill runs.

[10] Based on material obtained at local lumber yards.

[11] Minimum.

[12] Maximum.

transverse strength than corresponding material made on commercial machines. The strengths obtained are believed, however, to be more or less relative in so far as the different treating methods are concerned. The tensile strengths of all insulating boards met specifications except for those made of pulps produced from soaked chips and lime-cooked chips.

The pulp-sheet-test data obtained on the various board-pulp stocks were found to be indicative of the quality of insulating boards that could be produced from them. In general, the higher the pulp-sheet strength, the stronger the board; and the higher the pulp-sheet brightness, the lighter the color of the board.

None of the Western hemlock hardboards met the Federal specifications for modulus of rupture, though two of them (water cook, test No. 285, and steam cook, test No. 273) approximated that of the commercial sample B. As with the insulating boards, the strengths obtained cannot be considered as optimum values. The use of high pressing temperatures is said to favor hardboard quality, but the presses available were not equipped to investigate this variable.

The results of various treating methods used on Western hemlock slabwoods may be summed up as follows:

1. Boards produced from the milled, uncooked wood are likely to be, at best, marginal in strength properties.

2. For simplicity of process and strength of product, steaming appears to have an advantage over the other cooking processes. Steaming appears particularly advantageous for hardboards. Due to the organic acids evolved, precautions against corrosion might be required.

3. For these products, water cooking has no special advantage over steaming and would be more costly.

4. Cooking with 5% caustic soda (based on wood charged) would be satisfactory for insulating board, though a higher energy consumption in milling is indicated. The only advantage of the caustic-soda treatment over steaming is that ordinary steel digesters could be used. The results obtained by cooking with 2% of caustic soda indicates this to be an insufficient amount of chemical.

5. Four and 2 tenths per cent of sodium sulphite and 0.8 per cent of sodium bicarbonate (calculated as carbonate), based on wood charged, appear to be insufficient amounts of these chemicals to insure a good margin of strength with this type of digestion, but 7 to 8% of total chemicals should suffice. The energy consumed in milling the stock was very high Neutral sulphite liquors, however, have the advantages of being noncorrosive to ordinary steel and of producing relatively light-colored boards.

6. More than 2% of lime and longer cooking time than with the other cooking processes are indicated for this type of cook.

TABLE IV.—MILL PROCESSING DATA FOR THE STEAMED WESTERN HEMLOCK, DOUGLAS FIR, AND WHITE FIR WOOD WASTES

Cook No.	Mill Run No.	Plate[1] Setting, 1/1,000 inch	Freeness (Oliver), sec.	Energy Consumed, hp. days per ton of pulp	Proportion of Mixtures, parts	Energy Consumed for Pulp Stock Used, hp. days per ton of pulp
26	204	22.5	46	31.0	..	31
36	243	20	73	22.9	1	21
	244	30	37	19.4	1	..
37	248	20	56	34.9	..	35
37	248	20	56	34.9	4	31
	249	30	29	15.7	1	..
30	230	20	50	22.6	..	23
35	241	20	80	20.0	1	17
	242	30	33	13.6	1	..
39	252	50	..	....	..	..
	253	20	54	16.1	..	16
38	246	0	30	4.4	..	4
32	233	20	67	31.4	1	28
	234	30	36	24.6	1	..
31	231	20	60	31.4	3	28
	232	30	28	17.7	1	..
33	236	20	136	35.6	1	22
	237	30	36	17.8	3	..
34	238	20	195	37.8	1	23
	240	30	40	18.9	4	..

[1] B-980 plates run in a counterclockwise (cutting) direction.

Comparison of Insulating Board and Hardboard Made from Steamed Western Hemlock, Douglas Fir, and White Fir Wastes

The milling conditions and data on insulating board and hardboard made from the various wood wastes steamed for 15 minutes at 180° C. are given in Tables III and IV. On the basis of transverse-breaking loads corrected to ½-inch-thick boards of a density of 17 pounds per cubic foot, the Western hemlock slabwood and hogged veneer produced satisfactory insulating boards. The strength of the board made from hogged planer ends was, on the other hand, somewhat low, and the energy used in milling was lower than with the other hemlock wastes. Modifying milling conditions so as to increase the energy would probably have improved the strength, but very likely it would also have yielded a pulp with too high an Oliver freeness. This waste material appeared

TABLE II.—COOKING CONDITIONS USED IN TREATING WESTERN HEMLOCK SLABS AND EDGINGS

No.	Type	Amount of Wood (moisture-free) Treated, lb.	Amount of Chemical per 100 Pounds Moisture-free Wood, lb.	Volume of Liquor per 100 Pounds Moisture-free Wood, gal.	Duration of Cooking: Time to 120° C., min.	Time at 120° C., min.	Time to Maximum Temperature, min.	Time at Maximum Temperature, min.	Total Time, min.	Maximum Temperature, ° C.	Chemical Consumed, %	Yield: Chips Cooked, %	Fiberized Chips, %
7	Water cook	12.4	..	64.5	..	..	35	15	50	180	....	89.5	...
11	Water cook	12.6	..	63.5	..	..	30	15	45	180	....	87.3	..
27	Water cook	53.8	..	59.2	..	..	60	5	65	178	....	82.0	77.0
26	Steam	52.5	..	...	..	..	30	15	45	180	....	89.0	83.0
28	Steam	59.9	..	....	..	..	15	0	15	178	....	92.7	85.9
23	Caustic soda	12.5	2	30.0	25	35	25	35	60	120	100.0	95.7[1]	...
25	Caustic soda	50.0	5	30.0	15	30	60	0	60	150	98.0	90.0[2]	85.0
19	Neutral sulphite	12.5	5[3]	30.0	15	30[4]	63	0	63	180	83.0	93.0[5]	...
22	Lime	12.5	2	30.0	15	30	60	0	60	180	....	97.0[6]	...

[1] Chips were not markedly darkened.
[2] Chips were of a light brown color.
[3] Ratio of sodium sulphite to sodium bicarbonate (calculated as sodium carbonate) 5.25:1.
[4] In this cook, the temperature was approximately 125° C.
[5] Approximately half of the chips were completely penetrated; the others had light brown centers.
[6] Chips were not entirely free of lime deposits and were not greatly darkened by the cooking treatment. The pH of the spent liquor was 5.8.

TABLE III.—INSULATING AND HARD-PRESSED FIBERBOARDS MADE FROM WESTERN HEMLOCK, DOUGLAS FIR, AND WHITE FIR SAWMILL AND LOGGING WASTES

Type of Waste Material	Cooking Data [1]		Milling Data [2]		Sheet Test Data [3]					Insulating Board Data [4]							Hard Board Data [5]				
										Flexure											
	Digestion No.	Pulp Yield,[6] %	Bauer Run No.	Energy Consumed,[7] hp. days per ton	Freeness (Oliver), seconds	Bursting Strength, pt. per lb. per ream	Tearing Strength, g. per lb. per ream	Tensile Strength, p.s.i.	Density, g. per cc.	Brightness (Hunter)[8]	Test No.	Thickness, in.	Density, lb. per cu. ft.	Breaking Load, lb.	Deflection at 12 Pounds, in.	Breaking Load (corrected),[9] lb.	Tensile Strength, p.s.i.	Linear Expansion, %	Water Absorption, %	Test No.	Density, lb. per cu. ft.	Thickness, in.	Modulus of Rupture, p.s.i.	Water Absorption, %
Western hemlock slabs and edgings	26	83.0	241–244	31	46	0.14	1.34	445	0.30	15.2	225	0.49	17.7	12.4	0.84	11.9	261	0.50	4.1	271	60	0.129	5,120	16.1
Western hemlock planer hogged ends	36	81.0	248–249	35 [9]	51	0.09	0.94	221	0.31	14.5	317	0.55	16.4	11.4	0.42	10.1	154	0.65	4.9	319	63	0.144	5,270	14.6
Western hemlock hogged veneer	37	81.2	230	23	56	0.18	1.53	424	0.28	18.4	321	0.50	18.1	15.9	0.30	14.3	326	0.55	4.4	322	64	0.143	4,800	14.1
Western hemlock slabs and edgings	30	76.9	241–242	17	43	0.08	0.78	237	0.31	17.2	323	0.50	17.4	10.4	...	9.1	159	0.45	4.4	322	63	0.143	4,800	14.0
Douglas fir, old growth, slabs and edgings	35	78.8	253	16 [9]	54	0.04	0.45	68	0.28	14.4	316	0.54	17.9	8.2	...	8.0	124	0.60	4.9	324	57	0.154	2,750	14.3
Douglas fir, old growth, planer hogged ends	39	77.5	245	4	30	0.05	0.41	131	0.30	12.0	325	0.51	16.9	for board stock 14.2	0.52	12.8	330	0.60	4.9	309	62	0.147	2,250	14.2
Douglas fir, old growth, planer shavings	38	81.4 [9]	233–234	28	50	0.18	1.60	507	0.34	12.6	Material discarded as unsuitable	0.45	19.9			11.1	196	0.55	5.0	310	62	0.146	3,530	13.4
Douglas fir, old growth, slabs and edgings	32	82.8	233–234	28	50	0.18	1.60	507	0.34	19.9														
White fir cordwood	31	82.3	231–232	25	45	0.10	0.93	309	0.33	15.4	307	0.51	16.8	11.3	...	9.9	202	0.65	5.2	312	62	0.147	2,970	15.5
Mixture of Douglas fir, old growth, slabs and Western hemlock edgings [10]	33	77.4	236–237	22	47	0.09	0.92	232	0.31	14.6	315	0.49	18.1	10.3	...	9.9	202	0.65	5.2	312	62	0.148	3,580	15.5
Mixture of Douglas fir cordwood, second growth [10]	34	81.2	238–240	23	53	0.13	1.10	236	0.29	16.1	314	0.49	17.8	12.8	0.64	12.1	224	0.55	4.9	313	62	0.148	3,580	15.5
Mixture of Douglas fir, old growth, slabs and edgings [10], and white fir cordwood [10]																								

[1] Chips digested with steam on a schedule of ½ hour to 180° C. and ¼ hour at 180° C.

[2] See Table IV for detailed milling data.

[3] Tests made on sheets weighing approximately 20 grams per 64 square inches (340 pounds ream weight (25 × 40—500)). Tests made according to A.S.T.M. Emergency specifications, Designation ES-19, Aug. 24, 1942. The boards contained 4% rosin size. See Table I for specification requirements.

[4] Tests made according to Federal specifications LLL-F-311, July 12, 1940. The boards contained 4% rosin size. See Table I for specification requirements.

[5] A small proportionate amount of the treated chips were processed in a beater for yield determinations.

[6] Based on pulp yield and energy input to Bauer mill motors. Figures, though relative, are probably higher than would be obtained in continuous operation.

[7] Calibrated according to TAPPI Method T 217 sm-42.

[8] Corrected to 17 pounds per cubic foot density (708 lb. per 1,000 sq. ft.) and ½ inch thickness. See Table I, footnote 7.

[9] Cooked material processed twice. The large veneer strips were first run through Bauer mill with the plates at relatively large setting. The additional energy required was not recorded. Pulp washed and pressed but not beaten.

[10] Equal parts by weight.

to have been severely crushed in the hogging operation. The subjection of wood to high stresses prior to cooking by the acid-sulphite process has been shown to increase the susceptibility of the cellulose to chemical degradation *(1)*. A similar effect may have occurred here, since steaming is essentially an acid cook. The hogged veneer waste did not have this severely bruised appearance and gave satisfactory results.

The Douglas fir in all forms gave low strength boards. This may be due to the nature of the fiber or to the fact that this species contains considerable "extraneous" matter. The hogged planer ends gave particularly poor results. The planer shavings resulted in a sawdustlike product practically devoid of felting characteristics. This product after milling was, however, very free. Even at zero mill setting, that is, with the plates practically rubbing each other the energy consumed was only 4 horsepower day per ton of pulp. Possibly better results could be obtained with these shavings by using other type of plates than the B-980, but it is probable that a poor product would be obtained at best. Improved results with the other forms of Douglas fir waste might have been realized by modifying milling conditions. It is also possible that a cooking procedure other than steaming (neutral sulphite, for example) might have been advantageous for all of the Douglas-fir wastes.

The yields of pulp obtained from the Douglas wastes were several per cent lower than those from the hemlock, due, presumably, to the high content water-soluble, extraneous matter in the fir. This extraneous matter was probably responsible for a rather pronounced foaming tendencies noted with Douglas fir pulps. Washing of the pulps is suggested as a means of obviating foaming difficulty.

The white fir cordwood produced insulating board with satisfactory strengths when used either alone or in a 50-50 mixture with Douglas fir slabs and edgings. The 50-50 mixture of Douglas fir and edgings with Western hemlock slabs and edgings was promising.

The linear expansion with humidity changes was high for all of the insulating boards and, in general, exceeded the specification limitation. The reason for this is not known, but it is thought to be due to sizing or fiber formation rather than to species or in the cooking procedure.

None of the experimental hardboards met the strength required by the Government specifications; but the Western hemlock slabs and edgings, the Western hemlock hogged veneer, and the white fir cordwood would undoubtedly prove satisfactory with improved procedures.

Conclusions

It is concluded that Western hemlock mill and logging wastes can be converted into acceptable insulating board and hardboard provided the waste is not too finely

divided nor crushed excessively in preparing it for processing. For strength of product and simplicity of treatment, steaming appears to be a satisfactory method of softening prior to milling. By the steaming method, white fir is as suitable as Western hemlock, but Douglas fir alone gives definitely inferior boards. It is possible, however, that Douglas fir, especially the chipped slabwood and cordwood, could be used as a portion of the furnish. It is also possible that more favorable results could be obtained from Douglas fir by use of other cooking and manufacturing methods.

Literature Cited

1. Green, H., and Yorsten, F. H., *Pulp Paper Mag. Canada* 41, No. 2: 123 (Feb., 1940).

Program of TAPPI Asheville Meeting

The Alkaline Pulping and Chemical Products Committees of the Technical Association of the Pulp and Paper Industry will meet at Asheville, N. C., on October 9 to 11, 1947. The Southern and Southeastern Division of the Superintendents Association will meet at the same time in Asheville.

Meeting of Thursday, October 9th

Chemical Products Session — W. P. Lawrence, Champion Paper & Fibre Company, Chairman.

9:30 a.m. "The Butryic Acid Fermentation of Sulphite Waste Liquor," by Hilda S. Daniels and J. L. McCarthy, University of Washington, Seattle, Wash.

10:00 a.m. "The Separation of Lignin Sulphonic Acid from Sulphite Waste Liquor by Batch Dialysis" by Nevin K. Hiester, J. L. McCarthy, and H. K. Benson, University of Washington, Seattle, Wash.

10:30 a.m. "Seasonal and Geographical Variations in Tall Oil Composition," by W. H. Jennings, Camp Manufacturing Company, Franklin, Va.

11:00 a.m. "Progress Report on A.S.T.M. Standards of Analysis for Tall Oil," by Paul R. Wiley, West Virginia Pulp and Paper Company, Charleston, S. C.

11:30 a.m. "Extractive Materials from Southern Pine," by C. C. Porter, Southland Paper Mills, Lufkin, Texas.

1:30 p.m. "The Recovery of Crude Para Cymene," by John G. Lewis, Rayonier, Inc., Fernandia, Fla.

2:00 p.m. "Chemical Markets for Sulphate Turpentine," by P. O. Powers, Battelle Memorial Institute, Columbus, Ohio.

Events of Friday, October 10th

Visit to the mills of the Champion Paper & Fibre Company, Canton, N. C., and the Ecusta Paper Company, Pisgah Forest, N. C.

Meeting of Saturday, October 11th

Alkaline Pulping Session—K. G. Chesley, Crossett Lumber Company, Chairman.

9:30 a.m. "Time Pressure Control for Kraft Digesters and Consistency Control Between Blow Tank and Washers," by L. D. McGlothlin, Crown Zellerbach Corporation, Camas, Wash.

10:00 a.m. "A Pilot Plant Study of a Multicline Unit Operating on Stack Gases from a Lime Kiln," by T. T. Collins, Jr., Thilmany Pulp & Paper Company, Kaukauna, Wis.

10:30 a.m. "Methods for the Determination of the Oxygen Demand of Kraft Mill Wastes," by H. W. Gehm and William Moggio, National Council for Stream Improvement, New York, N. Y.

11:00 a.m. "Survey of Pulp Mill Sewer Sampling and Analytical Methods," by R. R. Fuller, Alkaline Pulping Committee.

11:30 a.m. Round Table Discussion on Reducing Sewer Losses in Alkaline Pulping Pulping Processes.

1:30 p.m. "Use of the enturi-Scrubber on Sulphate Recovery Furnace Stack Gasses," by T. T. Collins, Jr., and C. R. Seaborne, Thilmany Pulp and Paper Company.

2:00 p.m. "Operating Experiences with Cottrell Precipitators on Sulphate Recovery Gases," by L. M. Roberts, C. E. Beaver and W. H. Blessing, Research Corporation, New York, N. Y.

2:30 p.m. "Survey of Stock Gas Sampling and Analytical Methods," by T. T. Collins, Jr., Alkaline Pulping Committee.

3:00 p.m. Round Table Discussion on Reducing Chemical Losses in Stack Gases.

In addition to the presentation of papers and mill visits there will be an unusually fine series of luncheons, dinners and entertainment.

New England TAPPI Announces Meeting Dates

Arthur G. Dreis of the Hercules Powder Company, Holyoke, Mass., has succeeded T. S. Morse of the same company as Secretary of the New England Section of the Technical Association of the Pulp and Paper Industry. Mr. Morse was recently transferred to Wilmington, Del. The Section now has 204 members.

Following is the proposed schedule of meetings to be held in 1947 and 1948:

Oct. 17, 1947: Holyoke, Mass. "Stock Preparation," by Harry Williamson, Windsor Locks Paper Corp., Windsor Locks, Conn.

Nov. 20 or 21, 1947: Holyoke, Mass. "Paper Machine Operation," by B. L. Kassing, New York State College of Forestry, Syracuse, N. Y.

Dec. 18 or 19, 1947: Holyoke, Mass. "Paper Drying."

Jan. 15 or 16, 1948: Holyoke, Mass. "Paper Coating."

March 18 or 19, 1948: Boston, Mass. "Printing."

April 15 or 16, 1948: Holyoke, Mass. "Plastic Coating."

May 21 or 22, 1948: Marblehead, Mass. "Packaging Materials."

The dual dates mentioned above relate to a survey being made to decide whether Thursday or Friday evening meetings are preferred by the membership.

C. H. Child of the Merrimac Paper Company, Lawrence, Mass., is Chairman of the New England Section.

Pacific Coast Plans Seminar

The TAPPI Pacific Section will conduct a seminar on October 27 and 28 at Portland, Ore., and on October 29 and 30 at Seattle, Wash. The lecturer this year will be Dr. Herman Mark of the Polytechnic Institute of Brooklyn who is an authority on high polymers and cellulose chemisrty.